

point to which we would refer at the moment. Our correspondent appears to think that we are under the impression that the bombing machines which were destined for raiding London are being used for the defence of the Rhineland. Possibly our remarks could have been read to convey as much, but that was most certainly not what was in our minds. It is perfectly well known that the enemy employs in addition to the actual bombers, a certain number of fighting machines as escort. These latter are available for other work when not employed in raiding England. Also, we know that the Germans are not now over-supplied with first-class pilots such as are employed in raids on London, and in view of their heavy commitments on the Western front, and in the defence of their own towns these pilots are, for the time being, more usefully—from the German point of view—employed in other work. Even the bombing machines are, we believe, detached from their original purpose for work behind the Allied lines. It was these facts that we had in mind when we wrote.

A Week's Work in the Air. A recent summary of a week's work of the R.A.F. in the various theatres of war gives an illuminating idea of the manner in which the Allied air services have established complete ascendancy over the enemy, and of the ultimate effect air power seems destined to exercise on the issues of the war. During the week with which the summary deals, units of the R.A.F. were engaged in very heavy air fighting notably between Albert and the Amiens-Roye road, no fewer than 62 enemy machines being destroyed and 21 driven down out of control. In all, 26 British machines were reported missing, so that for every British machine missing more than three German aeroplanes are known to have been accounted for. The main significance of the figures is that while the enemy's concentration on this part of the front has been achieved at the cost of temporary inactivity in other sectors, the British airmen have not abated in the least their energetic and destructive raids into the enemy's territory. Quite apart from the intense activity which is connoted by the figures of the enemy's loss of machines, the British battle-squadrons made during the week under review a large number of raids on enemy positions far behind the lines, during which over 120 tons of bombs were dropped, attacks on Belgium and the Rhine towns being pressed with extreme vigour. The German people are still being told that Germany possesses a great superiority in the air, but it must surely be commencing to dawn upon them that the official representations are not in complete accord with all the facts. There are no longer moving stories to be told of harrowing destruction showered upon London and Paris, but in place there are the realities of persistent and continuous bombing of German towns, and there can be no doubt when the German newspapers are closely studied that the enemy people are becoming seriously disquieted at the turn of events. It is no longer possible to conceal the fact that Germany is unable to protect her long aerial frontier from the attacks of Allied aircraft.

The extent to which the German people are becoming frightened is amply evidenced by the numerous orders and recommendations which the authorities are making in anticipation of a growth of Allied

air activity, and from the fact that all who are able to leave are departing from the raided areas. Apart from the effect produced upon the *morale* of the German civilian population, it is evident that the military authorities are becoming increasingly disquieted. Captured orders evince a high state of nervousness with regard to aerial attack and show that considerable disorganisation is being caused behind the lines. One order recently found by the British instructs that vehicles in yards are to stand close up to the walls, and are to be concealed from the view of airmen, while field kitchens are to be set up only in sheds and under gateways. When visibility is good, roll-calls, concerts and ration issues are not to be held in the open. Another captured order lays down that within ten miles of the front only small groups of eight or ten men are to proceed together, and all troops are to take cover or get off the road when aircraft are reported. Motor lorries are not to cross a line ten miles from the front during the day, while at night no lights—not even pocket-lamps—are to be used. Obviously, all this in the aggregate must amount to a very serious dislocation of the enemy's plans, besides which the effect of constantly having to dodge aerial attack must have a very bad cumulative effect on the *morale* of the German troops. When we remember, too, that we are really only at the beginning of the Allied aerial offensive the moral once more becomes obvious that if the war is not actually to be won in the air, aerial operations will be the decisive factor.

The Bestowal of Honours. The method of selection of those who are, or are supposed to be, deserving of honour at the hands of the Crown is a matter which concerns everyone, and no apology is therefore needed for a further reference to a subject which has been discussed more than once in the pages of "FLIGHT" since the war and the creation of new distinctions and Orders has led to indiscriminate abuse of their award. In the *Times* recently there appeared a letter signed by 25 peers and other distinguished people, animadverting in strong terms against the lavishness with which distinctions are showered upon the worthy and the unworthy alike. The protest sets forth that unless the bestowing of honours and titles is protected from cheapening and is unmistakably cleared from the danger of a peculiarly mean kind of pecuniary corruption and reserved for real merit, honours may come to be regarded as dishonours, leaving no way out except their entire abolition. It is pointed out that an additional and very grave evil is that the money obtained by the disgraceful traffic in honours has gone to swell, and if rumour be true, has mainly constituted the large party funds which are at the service of party leaders and are used for party purposes.

We agree entirely—and have long since set out in strong language all these very points—with the views set forth in the letter, but, like a correspondent, signing himself: "An Untitled M.P." we should have been the more impressed if it had not been the case that every one of the 25 had inherited a title or accepted one in his own person. Nine of the signatories are peers of new creation, all of them are Privy Councillors, and not one but is a member of one or more orders of knighthood. There are some among them, notably two very distinguished sailors,



TO THOSE WHOM IT MAY CONCERN: IF **YOU** HAD TO TRUST YOUR LIFE TO THE MACHINE, WHAT THEN?

Extracts from Daily press :—"It was stated that the tank had not been riveted according to specification and that owing to the vibration in an aeroplane there would be a danger of petrol leakage. Fines amounting to £300 and £6 costs were imposed."

"Two men workers in an aeroplane factory were summoned . . . working on aeroplane spars they drilled a hole in a spar which was a quarter of an inch out. When the error was discovered they said nothing about it, and drilled another in the right place . . . One of the men, asked if he would like to fly in a machine in which such a spar was used, replied that he would not . . . The two were fined £10 each."

who have a full and just title by service to all that has fallen to them—and more. On the other hand, there are some whose titles have been given for service as politicians or as lawyers, and it seems to us that on this count the protest does not ring as truly as we would like.

Still, that is another matter which does not affect in the slightest the soundness of the argument presented, and with which we are in the very fullest agreement. As a matter of course, the 25 use the O.B.E. as one of their principal weapons, and point out that in a recent *Gazette* no fewer than 60 quarto pages were occupied by the list of appointments to this new Order. They do not suggest that there is any corruption in the awarding of its various classes, but they make the very sound point that it is quite impossible for any one Minister to supervise the selection of the recipients, and suggest that an effective safeguard would be the appointment of an independent Committee of the Privy Council to control the award of honours. Doubtless that would be an excellent remedy, since members of the Privy Council, having got all they can reasonably expect to secure in the way of honours, would be quite chary of admitting more than necessary to the charmed circle!

Whatever the remedy may ultimately be found to be, a remedy ought to be sought and applied, because the haphazard method of awarding honours for civilian services has become almost as great a scandal as the comparative parsimony with which services in the field are recognised. Everyone seems to be honoured but the fighting man in his turn. In the civilian departments it is practically a rule that a recommendation from the head means the grant of an honour. In the fighting services, risk run and splendid work performed in the face of the enemy may bring two or three or even more "recommendations" and "mentions," with nothing more tangible than the feeling of good work well done, and that for pay which would bring half the civilian staffs out on strike. It is very much to be hoped that the discussion in Parliament which is foreshadowed by the "25" will bring about a much-needed change in both directions. What is required is more recognition for the fighting man who is risking life, health, and limb, and less for the civilian who is sitting tight in a "cushy" job at home, together with strict justice in awarding honours to both.

A
Boycott of
Hun Trade.
Mr. Havelock Wilson is a man after our own heart. Having got it well settled that our British seamen will have nothing to do with the Hun or his trade for a term of at least six years after the war, he has set himself to discover the true feeling of the country in the matter of extending the boycott to all classes of trade and industry. And he appears to be having an extraordinary amount of success in focussing opinion in this matter of capital importance to the future of the world. So far as we have been able to discern, the Government have no policy for after the war, or if they have they have been most careful to conceal it. It is probable that, as ever, they are waiting for a lead from the country, and thanks to Mr. Wilson, and the Merchant Seamen's League, it looks as though they would get it. There is very little question but that the bulk of the people have made up their minds to have no more dealings with the outcasts of civilisation who have plunged the world into a welter of bloodshed, but the feeling is one which requires to be properly focussed and be brought into practical line as a policy. It is of no avail to individualise it and depend upon each one singly to refuse to buy from or sell to Germans after the war. We may be very sure that the Hun will leave nothing undone to retrieve his commercial position. We know him to be a very master of organisation, and that what he cannot do for himself he will try to do through agents and nominees. Unless, therefore, the Government is made to realise that the country as a whole desires, and will not permit, the Hun to trade within our borders—until he has purged his crimes against humanity, we shall find that we have almost insensibly gone back to the old order of things. If we understand the intentions of the Merchant Seamen's League, it is aiming at getting it made illegal to have dealings with enemy countries for six years after the termination of hostilities—that we are openly and frankly to declare a trade war on them to follow the military conflict. With that object we have the very fullest sympathy. We have done without the Germans for more than four years, and our industries have surprised themselves by their own achievements, and, apart from all other considerations, it will do no harm for us to be thrown upon our own and our Allies' resources for a further period of peace. By all means, then, let us boycott them—industrially, commercially and socially.

INTERNATIONAL AIRCRAFT STANDARDS.

As there appears to be some misapprehension with regard to the question of the standardisation of aircraft materials and parts, it is timely to point out what has been done and what is being done. There are two aspects of the situation—the National efforts at drawing up specifications for materials and parts for immediate use and the more difficult one of attempting to arrive at truly International standards. When at the request of the Society of British Aircraft Constructors the British Engineering Standards Association at the end of 1917 formed a special sectional committee, the Air Ministry decided to place entirely in the hands of the B.E.S.A. as a war measure the standardisation of aircraft materials for the Services. The Sectional Committee, which is now under the chairmanship of Sir Arthur Duckham, K.C.B., Director-General of Aircraft Production, governs the whole of this work and has some sixty sub-committees and panels engaged in drafting specifications, including the revision of many of the old Air Board specifications. This work is being carried out as a war measure for the Department, and consequently the specifications are not issued to the general public but to the department itself for distribution to manufacturers.

Already 40 British standards are in use and others are in various stages of preparation.

The sub-committees engaged on the work are as follows, the chairman's name being given in brackets:—Nomenclature (Col. M. O'Gorman, C.B.), Timber, Glue and Casein Cements (Capt. G. W. C. Kaye, R.E.), Propeller Hubs and Fixings (Capt. A. A. Ross, R.A.F.), Water and Fuel System (Mr. A. E. Berriman, O.B.E.), Electrical parts (Mr. C. C. Paterson, O.B.E.), Instruments (Maj. C. J. Stewart, R.A.F.), Ball and Roller Bearings (Dr. Hele Shaw), Sparking Plugs (Brig.-Gen. Sir Capel Holden, K.C.B.), Wheels and Tyres (Maj. J. H. Ledeboer, R.A.F.), Magnetos (Lieut.-Comdr. E. S. Saunders, R.N.V.R.), Rigging (Lieut.-Col. C. F. Jenkin, M.B.E.), Rubber, &c. (Capt. Kaye), Dope and Fabric (Capt. Kaye), Steels (Mr. A. A. Remington), Copper Alloys (Lt.-Col. Jenkin).

As recorded in "FLIGHT" some time ago the Inter-Allied Aircraft Conference is giving its attention to the question of International Standards.

The Aircraft specifications of the five countries are being circulated to the National Committees through the intermediary of the Control office, established in London (for the time being at the offices of the B.E.S.A.).

THE HANNOVERANER BIPLANE.

Report issued by Technical Department (Aircraft Production), Ministry of Munitions.

[In our issue of May 30th we published some sketches and a brief description of the Hannover biplane, promising to return to this machine in more detail later. We have now received the following official report on the machine, which will therefore take the place of the description which we had intended to prepare. The report will not, perhaps, be found quite so thorough as those which we ourselves have hitherto prepared, but we think that in spite of this all the main features have been dealt with.—ED.]

THIS machine was brought down by anti-aircraft fire near Lestrem, on March 29th, 1918. As will be seen from the photographs, it is of highly characteristic design, and possesses numerous features of interest.

On labels protected by celluloid, and on the upper surfaces of the wings and fuselage, are identification marks with the date 15/2/18, showing that this machine is of recent construction.

Generally speaking, the construction is of wood throughout, steel being used sparingly, except in the interplane struts, landing chassis struts, centre section and some details of the tail.

Judged by contemporary British standards of design, the Hannoveraner biplane reaches a fairly high level, the construction throughout being sound, and the finish quite good.

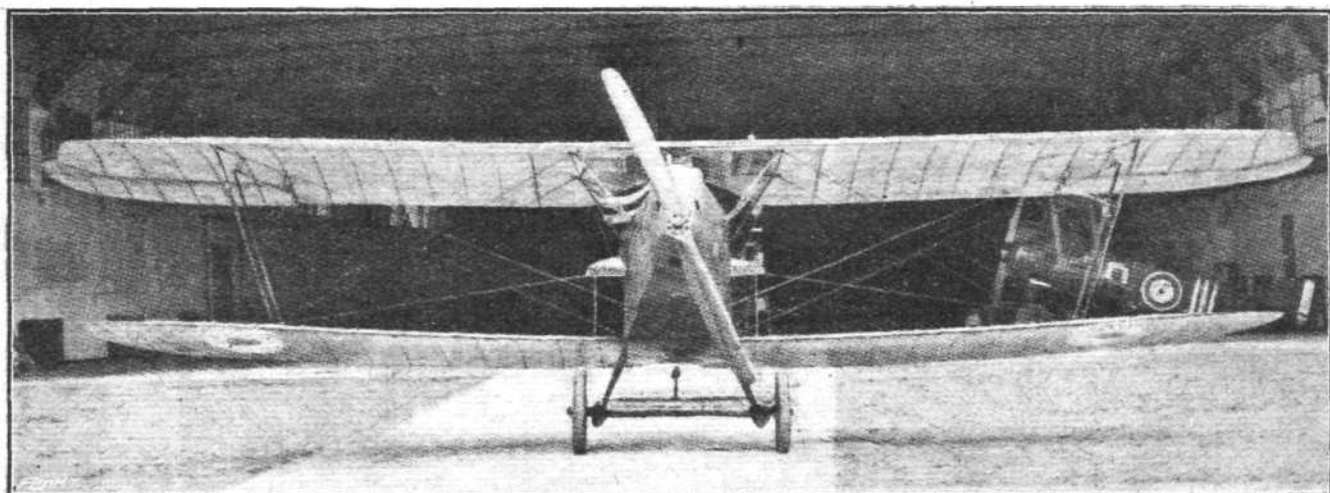
The performance of the machine is not by any means bad.

The leading particulars of the machine are as follows:—Weight empty, 1,732 lbs.; total weight, 2,572 lbs.; area of

Performance.—(a) Climb to 5,000 ft., 7 mins.; rate of climb in ft. per min., 590; indicated air speed, 68; revolutions of engine, 1,495. (b) Climb to 10,000 ft., 18 mins.; rate of climb in ft. per min., 340; indicated air speed, 65; revolutions of engine, 1,475. (c) Climb to 13,000 ft., 29 mins. 45 secs.; rate of climb in ft. per min., 190; indicated air speed, 62; revolutions of engine, 1,445.

Speed.—At 10,000 ft., 96 miles an hour; revolutions, 1,565. At 13,000, 89½ miles an hour; revolutions, 1,520. Service ceiling at which rate of climb is 100 ft. per min., 15,000; estimated absolute ceiling, 16,500; greatest height reached, 14,400 in 39 mins. 10 secs.; rate of climb at this height, 120 ft. per min.; air endurance, about 2½ hours at full speed at 10,000 ft., including climb to this height; military load, 545 lbs.

Stability.—The machine is nose-heavy with the engine off, and slightly tail-heavy with the engine on. It tends to turn to the left with the engine on.



Front view of the Hannover biplane.

upper wings, 217.6 sq. ft.; area of lower wings, 142.4 sq. ft.; total area of wings, 360 sq. ft.; loading per sq. ft. of wing surface, 7.29 lbs.; area of aileron, each, 16.4 sq. ft.; area of balance of aileron, 1.6 sq. ft.; area of top plane of tail, 10 sq. ft.; area of bottom plane of tail, 19.2 sq. ft.; total area of tail plane, 29.2 sq. ft.; area of fin, 6.5 sq. ft. approx.; area of rudder, 6.4 sq. ft.; area of elevators, 22.0 sq. ft.; horizontal area of body, 53.2 sq. ft.; vertical area of body, 91.6 sq. ft.; total weight per h.p., 14.3 lbs. per h.p.; crew, pilot and observer; armament, 1 Spandau firing through propeller, 1 Parabellum on ring mounting; engine, Opel Argus, 180 h.p.; petrol capacity, 37½ gallons; oil capacity, 3½ gallons.

Controllability.—The machine is generally light on controls, except that the elevator seems rather insufficient at slow speeds. It is not very tiring to fly, and pulls up very quickly on landing.

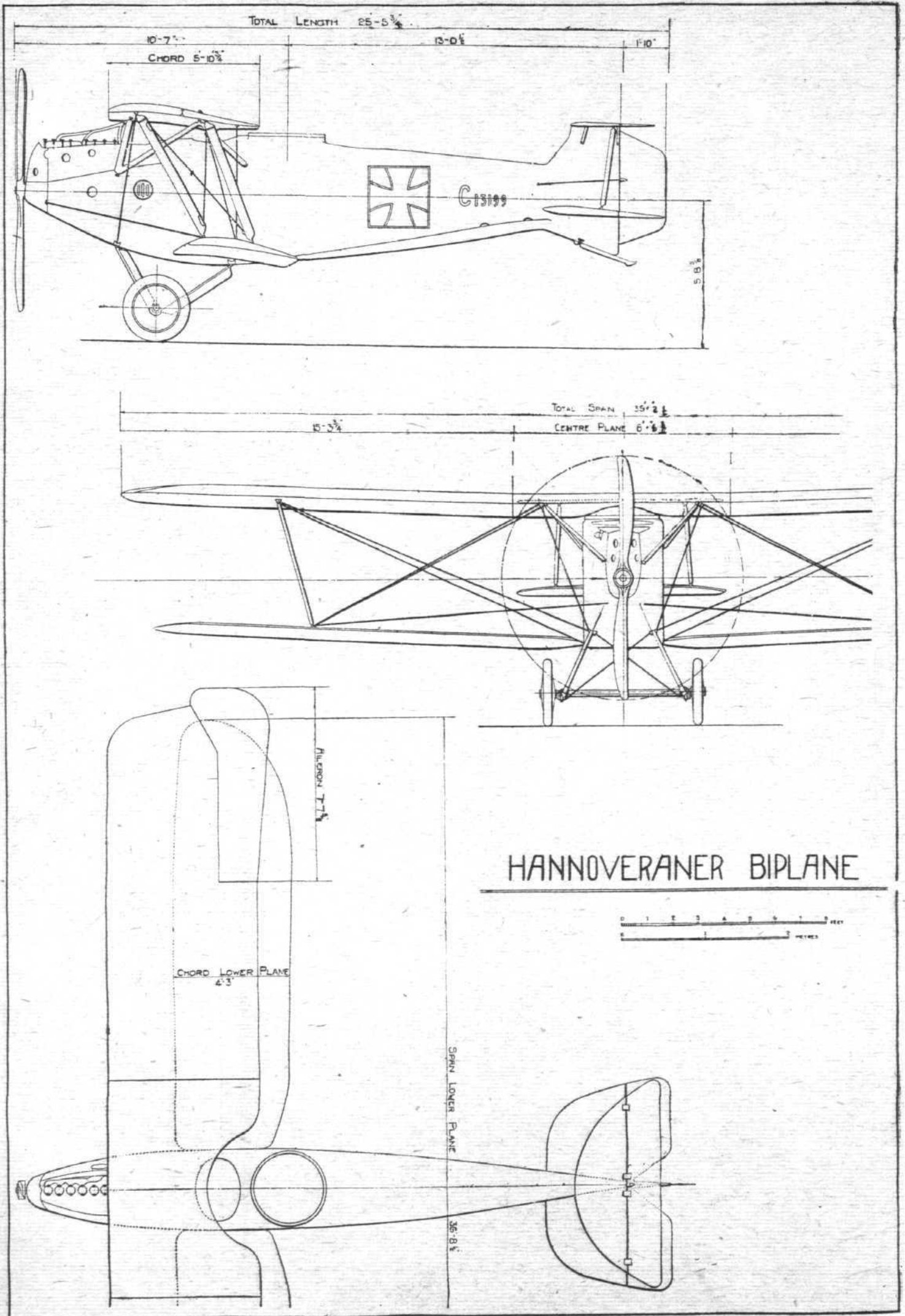
View.—The view is particularly good for both pilot and observer. The former sits with his eyes on a level with the top plane, and also enjoys a good view below him on account of the narrow chord of the lower plane.

Construction.

Wings.—The general arrangement of the Hannoveraner wings is somewhat reminiscent of the R.E.8, except, of course, that the bottom planes have no ailerons. The upper wings



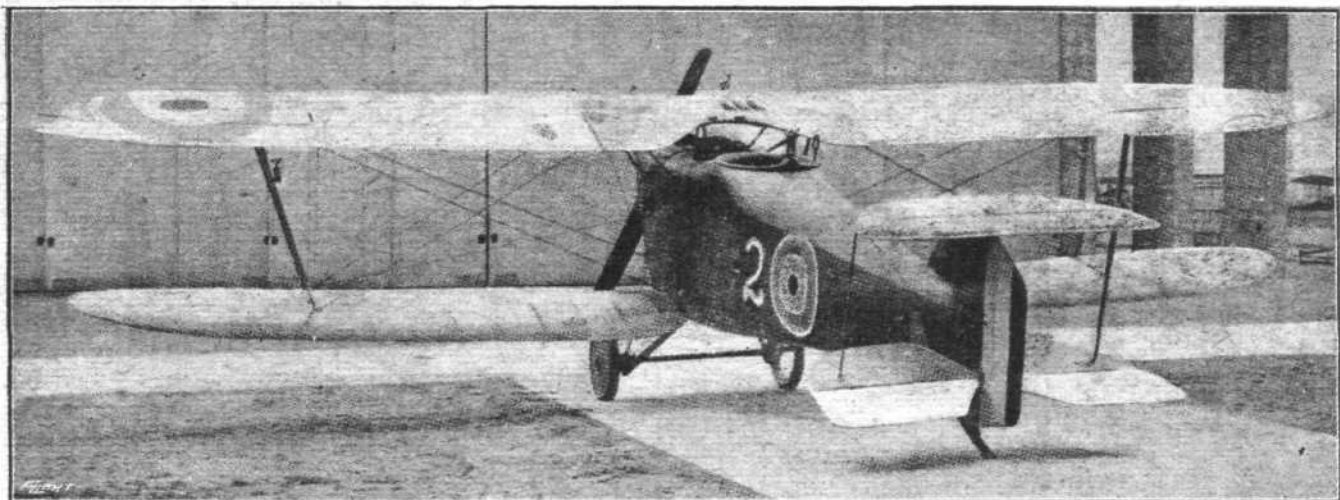
Side [view of
the Hannover
biplane.



General arrangement of the Hannover biplane.

are practically flat in end elevation, but the lower have pronounced dihedral angles of 2.7 deg., and are set with a positive stagger of 2 ft. $7\frac{1}{2}$ ins. The chord of the upper plane is 5 ft. $10\frac{1}{2}$ ins., and that of the lower plane 4 ft. 3 ins. In flying position, therefore, the trailing edge of the lower plane

In Fig. 2 is given a scale drawing of the complete rib. The spars are of the usual built-up hollow section. The attachment between the wings and the fuselage is such as to permit quick detachability in case of need. It consists of a simple ball and keyhole socket device. The spars terminate in steel



Three-quarter rear view of the Hannover biplane.

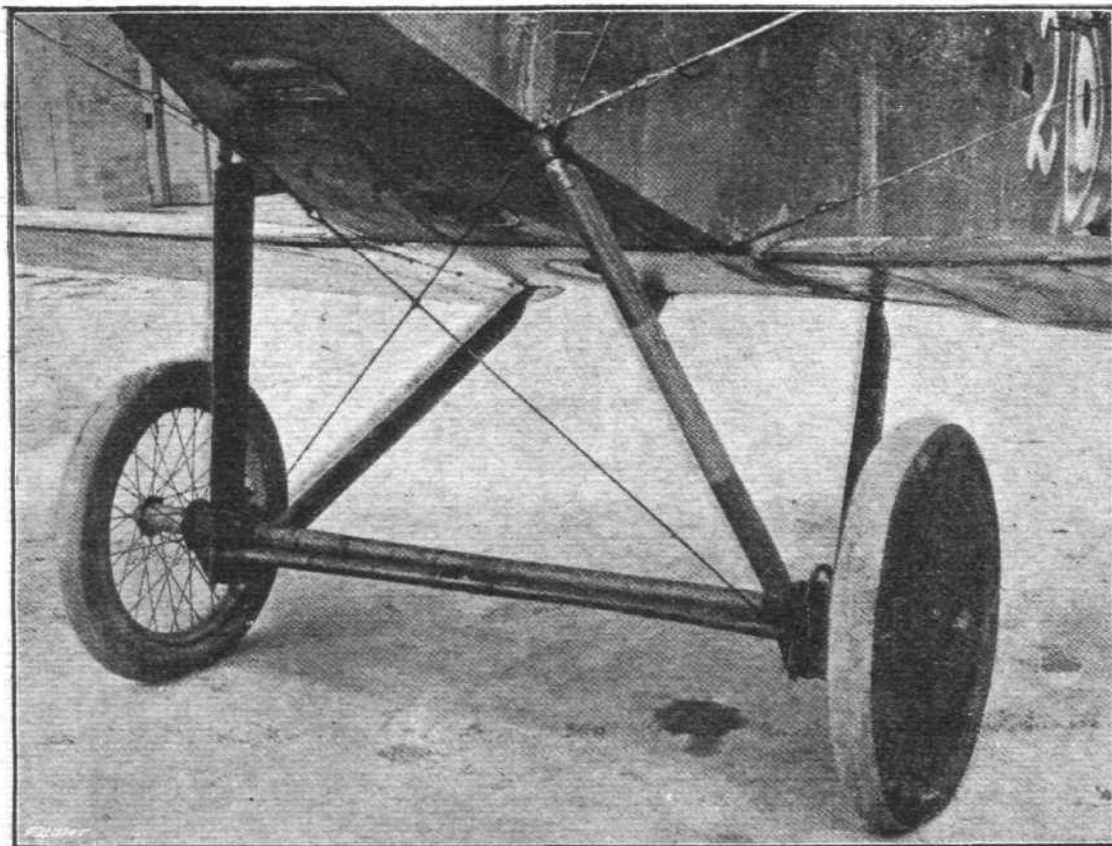
is slightly in advance of that of the upper plane. The angles of incidence marked on the manufacturer's rigging diagram, which is fixed to the side of the fuselage, and stamped on the fabric of the wing, are as follows:—Lower wings, $5\frac{1}{2}$ deg. at fuselage, 5 deg. at struts; top wings, 5 deg. throughout.

The lower wings are carried direct from the bottom edge of the fuselage, the roots of the upper planes being carried on a rigidly constructed centre section, which embraces the radiator and the gravity feed petrol tank. The rearward portion of the centre section is cut away immediately over the pilot's seat, and at this point the wing is about 1 ft. above the upper surface of the fuselage. The lower plane has no

boxes with horizontal slots which engage with knobs or balls mounted on the fuselage members. On entering the knobs into the slots and sliding the wings backwards for a distance of $\frac{1}{2}$ in., the necks of the balls are engaged with the constricted part of the slots, and are then maintained in this position by vertical bolts passing through the spar boxes.

Spring doors are fitted on the lower plane to allow of the inspection of the pulleys for the aileron control wires.

Struts.—These are of plain steel tubing of $1\frac{1}{8}$ ins. diameter, and are fitted with wooden fairings, secured by wrappings of fabric, the final section being of fair streamline form with a length of $4\frac{1}{2}$ ins. and a breadth of $1\frac{1}{4}$ ins. The ends of the



The undercarriage of the Hannover biplane.

very pronounced wash-out, but this feature is more noticeable in the upper plane, and is enhanced by the design of the ailerons, the tips of which are set at a slightly negative angle. This gives the characteristic German appearance to the aeroplane when seen in flight. In contrast with that of the majority of German aeroplanes, the wing section is rather flatter than usual. (Fig. 1.)

strut tubes are tapered, welded up and drilled, the method of attachment to the spars being shown in Fig. 3.

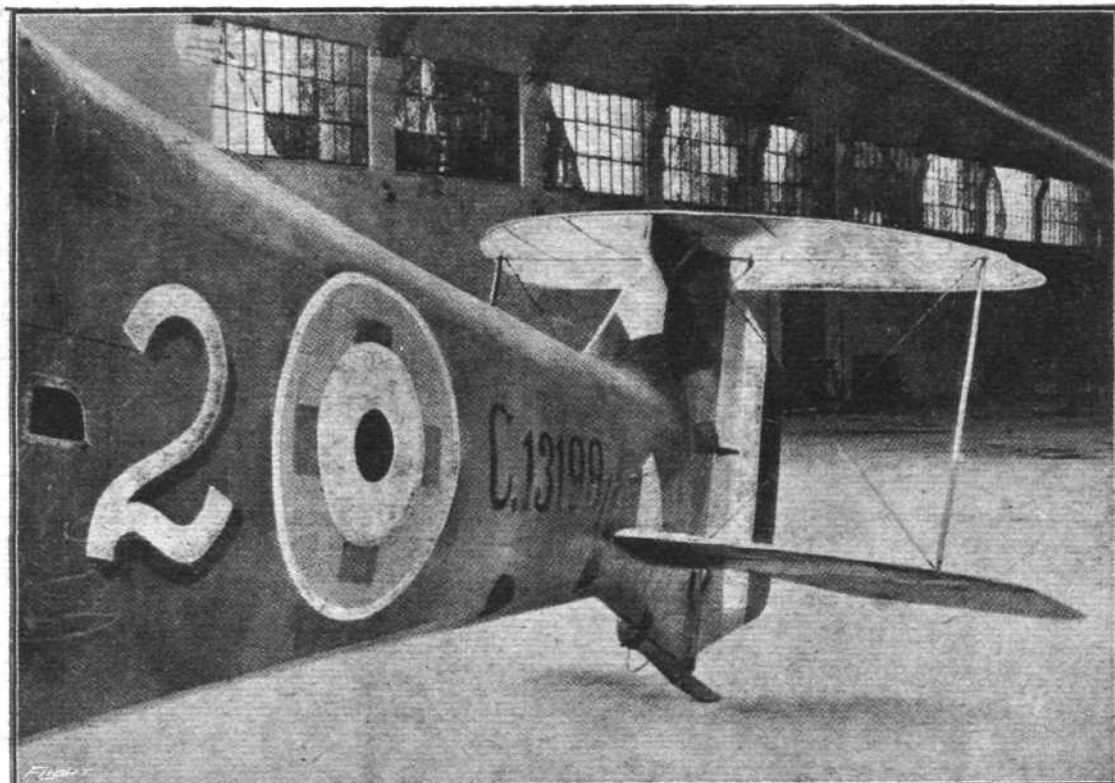
The centre section struts are streamline section, and consist of flattened steel tubes, welded together so as to form a triangulated construction. These struts are secured to the fuselage in the manner set forth in Fig. 4. At their upper extremities, as shown in Fig. 5, they terminate in ball and

socket joints, the box portions of which are carried on the spars of the top plane centre section.

With regard to the strut sockets used in other positions, and as illustrated in Fig. 3, these are of a standardised design, except the tubular socket itself, which is adapted to be welded

Wiring is absent from this construction, but the *fuselage* is transversely braced internally with wooden diagonal members, which, however, occur at only one point about half-way between the gunner's cockpit and the tail. This is shown in Fig. 7.

Three-quarter front view of the biplane tail of the Hannover.



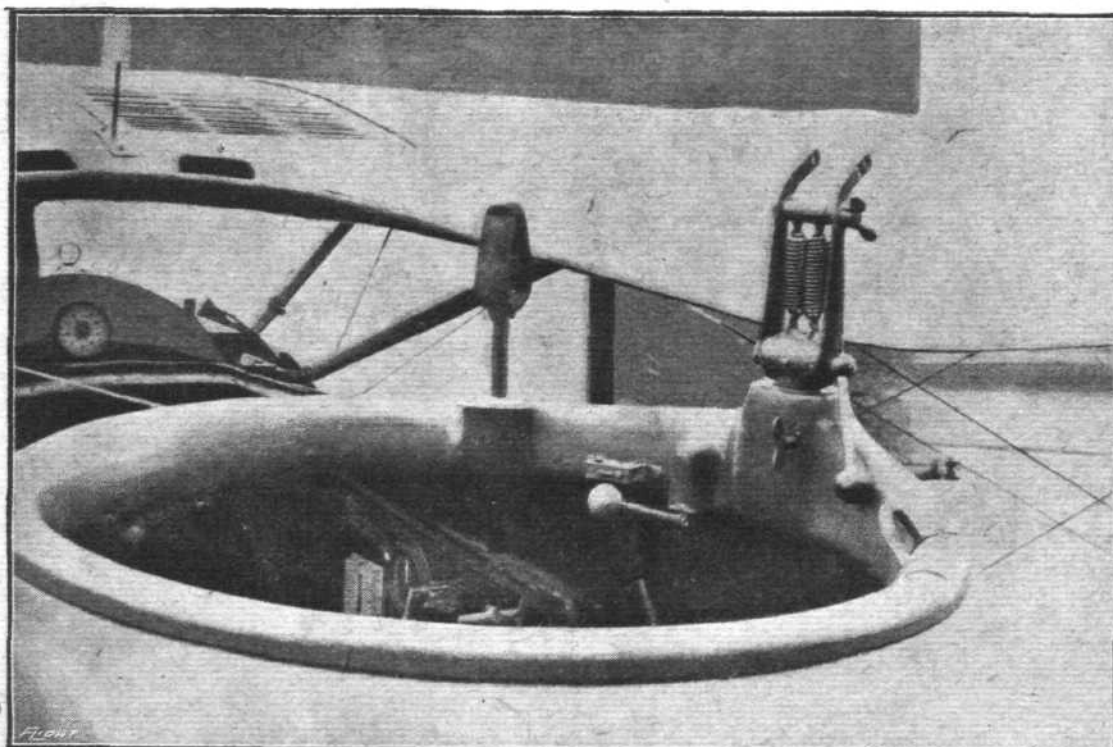
on to the spar plate at different angles according to circumstances.

The main lift wires are taken from the strut sockets of the upper plane to the bottom edge of the *fuselage*, and are there anchored to stout clips, of the type shown in Fig. 6. These clips are bent round the bottom of the *fuselage* longeron, and have a horizontal extension carrying a steel strap which passes right across the *fuselage*, immediately under its wooden transverse member.

Fuselage.—This is of approximately rectangular section amidships, tapering off to oval near the tail. It consists of

At the tail end of the *fuselage* holes are cut in the covering to facilitate lifting the tail, so that the weight of the machine is carried on the *longerons*. In Fig. 7 can be seen at the extreme end of the *fuselage* a strut fastened to cross members. This continues to the top of the fin and forms an attachment for the upper plane of the tail.

The depth of the *fuselage* at the gunner's cockpit is unusually great, being 4 ft. 7 ins., with a width of 3 ft. 2 ins. Forward of this point the *fuselage* is sharply tapered in the vertical plane, but more gently faired off in the horizontal plane.



The gun ring of the Hannover biplane, showing lock.

the usual wooden framework of four *longerons* reinforced and covered in with three-ply wood $\frac{1}{8}$ in. thick. This is applied in square panels in similar manner to that which obtains in the Albatros machines, but in this case is covered all over with doped fabric.

The engine is only partially covered in. Between the pilot's and gunner's cockpit is fitted a stout cross member of steel tube.

Undercarriage.—This is of the usual design, consisting of tubular steel struts with wooden fairings wrapped on with

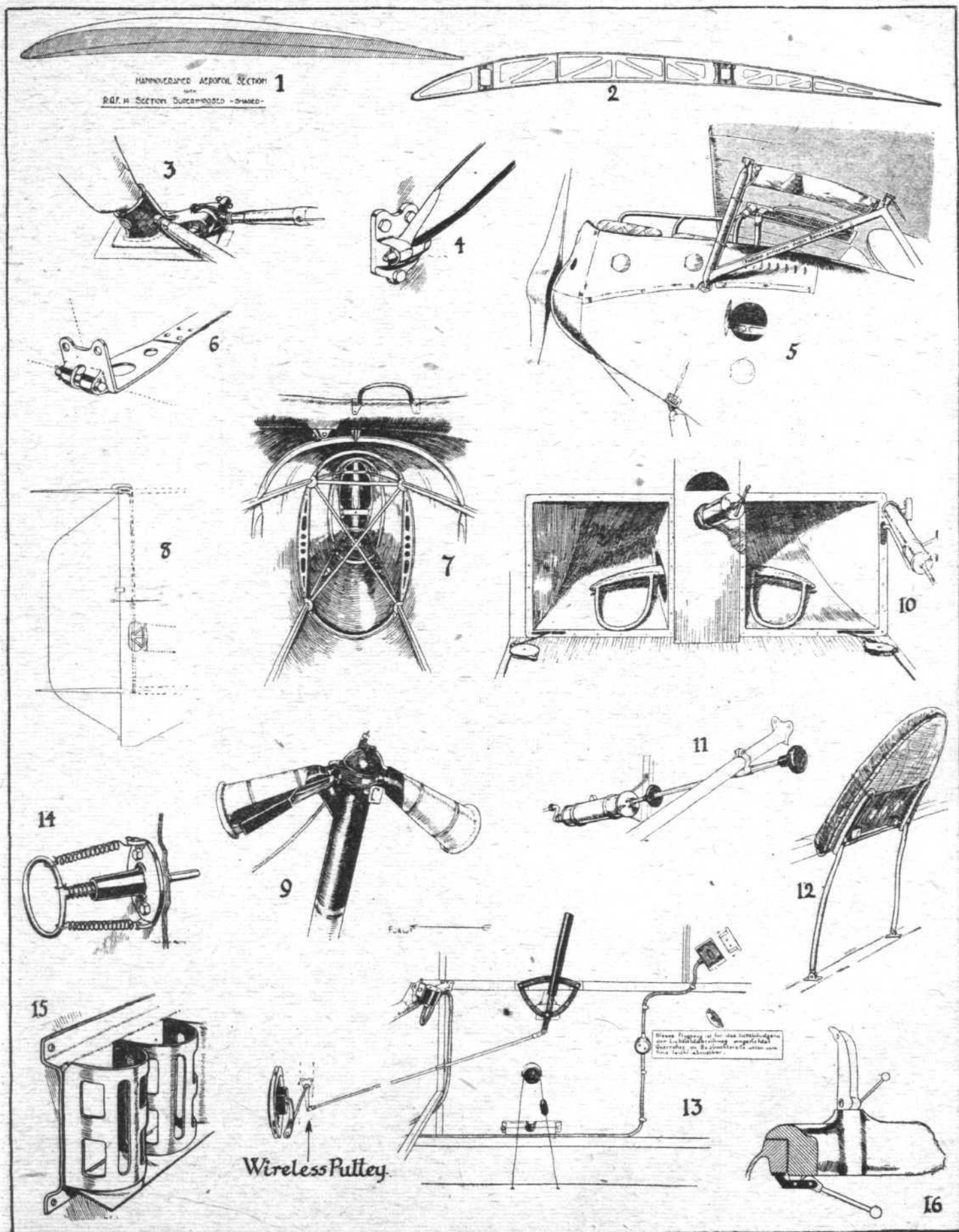
tape. The forward struts are attached to the fuselage by a joint which also acts as the anchorage of the forward flying wires, and for the undercarriage cross bracing cables. The turnbuckles of the latter are furnished with spherical heads which are carried in cups pressed out of the lug plate. The actual junction of the strut and the socket is formed by a ball and cup.

The shock absorbers are triple coil springs, enclosed in a fabric covering.

The wheels are 760 by 100, and are covered in with fabric discs in the usual manner.

Engine Mounting.—The engine is carried on I-section bearers bracketted to vertical members of the forward part of the fuselage. One of these bearers is visible through the inspection door, which is shown open in Fig. 5.

Engine.—The motor fitted is a 180 h.p. Opel, upon which a separate report is issued. It is of standard 6-cylinder vertical type, and is designed on the accepted German lines.



Some constructional details of the Hannover biplane. Figs. 1 to 16.

Empennage.—One of the most characteristic features of the Hannoveraner machine is the biplane tail, of which the span is unusually small. The upper plane is mounted on the fin, which in itself forms a streamline extension of the rearward portion of the fuselage. As in previous German types which have been described, the merging of the stream into the fin is very neatly carried out. The object of the biplane tail is evidently to mitigate the masking effect of the tail on the movable gun, as there is evidence that the gunner habitually fires through the tail at hostile machines approaching from behind. The bottom plane is covered with $\frac{1}{8}$ -in. three-ply wood throughout, and the top plane with fabric. The fin is likewise covered with three-ply on which is applied a layer of fabric. Both upper and lower planes are fixed, there being no means of tail adjustment provided.

Whereas the upper plane is flat and thin, the bottom plane is heavily cambered top and bottom. It is fitted with barbs to prevent mechanics lifting the machine by the tail. An inclined interplane strut is fitted on either side of the fin. This is of steel tube of approximately streamline section, and each cell so formed is furnished with cross bracing wires. That portion of the fin which extends below the fuselage is used to provide the mounting for the tail skid, the general arrangement of the tail being shown in photograph D. The tail skid is not provided with a swivel mounting, but has a solid metal shoe of good dimensions with convex underside, allowing the skid

not fixed, but is carried by a tubular sleeve which is capable of rotation around the control stick tube. By moving this lever circumferentially, the throttle is controlled by means of a crank which is carried at the bottom end of the control stick sleeve. The throttle lever is fitted with a ratchet operated by a grip lever, as shown in the sketch.

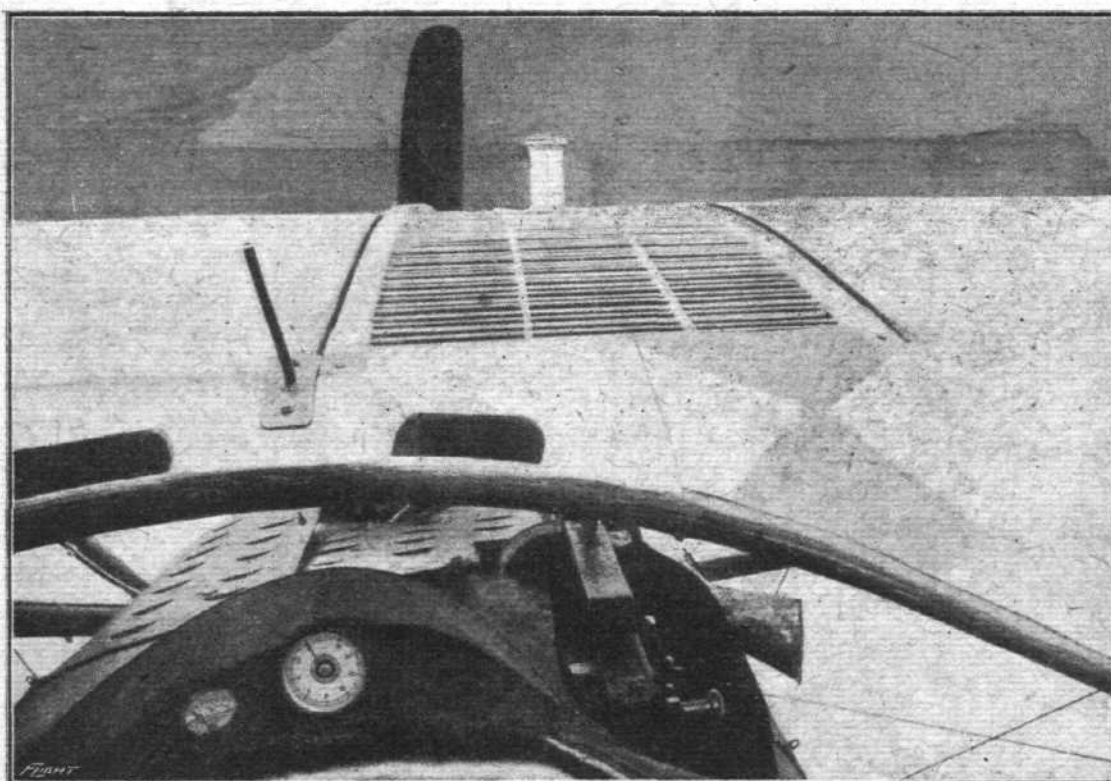
The elevators are controlled by the usual double-ended cranks, the wires being carried down the fuselage in small tubular guides.

The rudder bar is built up of welded sheet steel, and is fitted with the usual heel rests. It is placed forward of the bulkhead, which provides a dashboard in front of the pilot's seat, and on each side, as shown in sketch, Fig. 10, sheet metal casings are provided for the pilot's feet. This construction, which is, of course, dictated by considerations of body length, has the advantage of preventing the draught which usually comes from the underside of the pilot's cockpit.

The rudder control wires pass over pulleys on either side of the base of the cockpit, and thence down the fuselage to the rudder.

Engine Control.—The main throttle control is as described above. In addition, however, there is an independent throttle control, consisting of a push rod carried through an opening on the dashboard. Either control can be used independently.

The ignition advance lever is similarly arranged, and



View of the

radiator of
the Hannover.

to sideslip in answer to the rudder when running on the ground. It is sprung with elastic bands at its forward end.

The elevators are worked together, and are coupled up as shown in Fig. 8. It will be noticed that this arrangement, in which the upper and lower links are brought to separate pins, and not to a single pin, results in the elevators being worked through slightly different angles, but this differentiation is in practice, of course, inappreciable.

Control.—The ailerons are fitted to the top plane only. They measure 7 ft. 9½ ins. long, and project at each side about 7 ins. beyond the fixed wing tip. The framework on which they are built consists of light steel tubing. The maximum chord of the aileron is at the wing tip, where it reaches 1 ft. 11 ins., having a minimum chord of 1 ft. 6 ins. at its inner end. A balancing area of approximately 1 sq. ft. is provided forward of the aileron pivot. The aileron control embodies a curved lever passing through a slot in the main plane immediately ahead of the aileron. From each end of this lever, which forms part of the aileron framework, wires are taken to pulleys on the lower wing, whence they proceed in guides behind the leading wing spar to the control stick, to which they are attached in such a manner that each aileron is actuated positively by a direct pull from the control stick, and not through the medium of a balancing wire.

The control lever is of a type not previously found in German models. As shown in Fig. 9, it is provided with two inclined wooden handles, one of which, on the left side, is

consists of a rod thrust through a plate on the dashboard and terminating in a small fibre handle.

Radiator.—In accordance with the usual practice characteristic of German machines of this type, the radiator forms a part of the upper plane centre section. It has an area of 27 ins. by 16 ins. and consists of the usual oval section horizontal tubes.

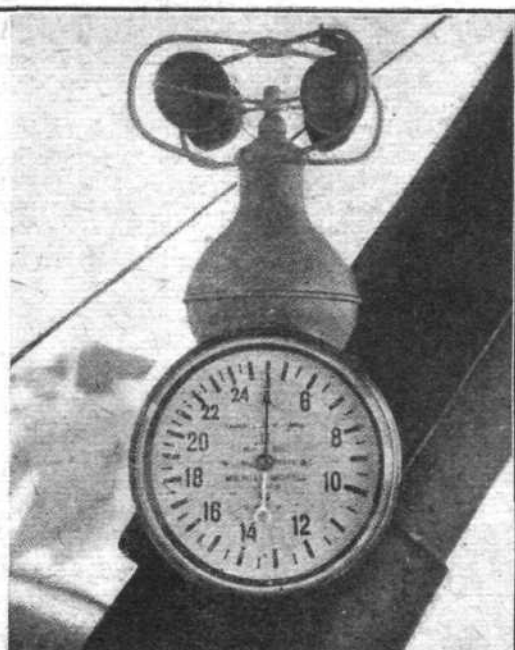
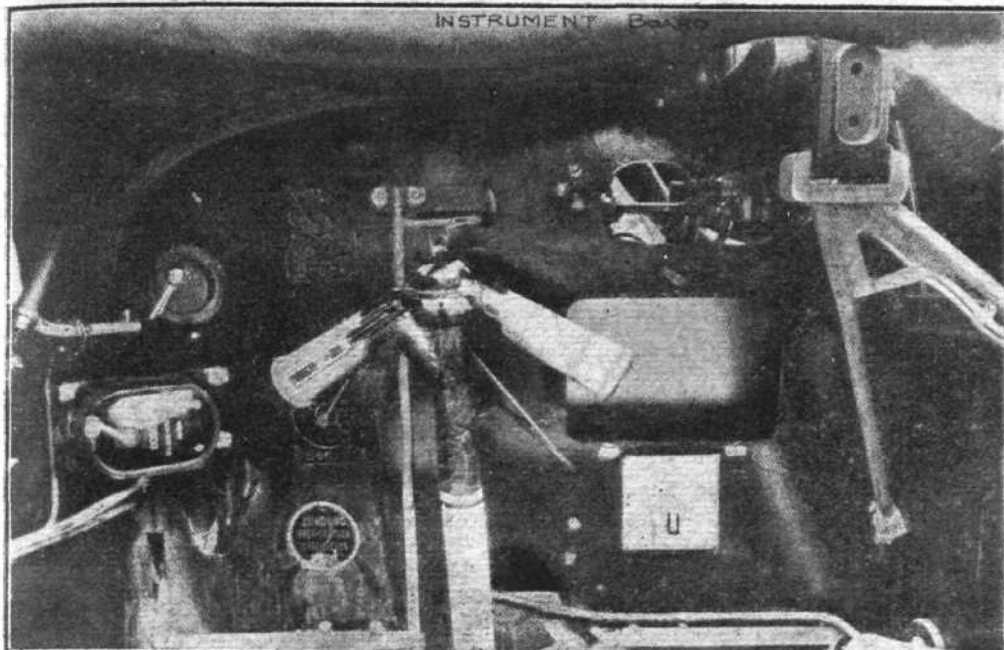
Underneath the radiator and attached to the underside of the centre section is a circular grooved ring. This is evidently intended to carry a semicircular disc which is pivoted in a bearing fixed in the side of the radiator, and the object of which is to act as a controllable radiator shutter.

Petrol System.—The main petrol tank has a capacity of 30 gallons, and is fitted under the pilot's seat. It is circular in section. On the left-hand side of the top plane centre section close beside the radiator is a subsidiary tank, feeding by gravity to the carburettor. This is used for starting-up purposes. On its underside it carries a simple form of level indicator.

The main tank feeds the carburettor by air pressure, which is normally .25 gr. per sq. cm.

A hand air pump is mounted on the right-hand side of the pilot's cockpit, and, as shown in sketch, Fig. 11, is fitted with a long handle so as to be worked by either the pilot or the observer.

The main tank is furnished with a Maximall petrol level gauge, employing the principle of a float operating a dial by



Instrument board and control handle of the Hannover biplane. On the right the air-speed indicator, which is mounted on an inter-plane strut.

a cable passing over pulleys and enclosed in a sealed piping system. Provision is made for filling the gravity tank from the main tank by means of a semi-rotary hand pump mounted on the left side of the pilot's seat. Taps are arranged so that the carburettors can be fed from either tank.

Oil.—This is contained in a tank on the starboard side of the engine. A glass level gauge is built into the side of the tank, and the covering of the fuselage is cut away at this point so that the oil level is easily visible.

Wireless.—No wireless fittings were found in this machine, but it is adapted to take the apparatus when required.

On the rear end of the engine crankshaft is a driving pulley, which can be brought into action by a clutch operated from the observer's seat. A bracket fitted on the port side of the engine over the rudder bar is evidently intended to carry the dynamo. The latter would also provide current for heating, plugs for this purpose being arranged conveniently to both pilot and observer.

Observer's Cockpit.—The observer is provided with a spring-up folding seat, which is so low, that when seated the observer has his head level with the gun mounting. A sketch of this seat is given in Fig. 12.

Provision is made for the use of a camera through a hole in the bottom of the cockpit. This is normally covered by a sliding panel, which is operated by a return wire running over a pulley. The label shown in Fig. 13 carries the following inscription:—

"This machine is arranged for photographic utensils (apparatus, implements, &c., not camera) of the photographic department. The cross tubes in the observer's cockpit low down in front are easily taken down."

The clips for holding these cross tubes are shown in Fig. 13.

A small board about 12 ins. square can be let down from

the back of the pilot's seat for writing purposes, and shuts up out of the way when not required.

Clips are provided for carrying maps, &c.

On the right-hand side of the observer's cockpit is a small pull lever, shown in Fig. 14. In its normal position this rod projects through the side of the fuselage and supports on its outside the hinged bottom of a series of metal pockets, made as shown in Fig. 15. It is not quite clear what purpose is answered by this fitting. Whatever the pockets contain would be simultaneously discharged on pulling the lever.

Instruments.—An air speed indicator of the revolving anemometer type, by Morell, of Leipsic, is fitted on the forward left-hand wing strut, where it is readily visible to both the pilot and the observer.

With this exception, the instruments fitted on the machine, comprising engine revolution counter, compass, barometer, &c., are all of standard type.

Propeller.—This is stamped 180 P.S. Argus. It is composed of laminations alternately ash and some species of soft pine.

Fabric and Dope.—Both appear to be of good quality, and are up to the usual German standard.

Camouflage.—As will be seen from the photographs, the main planes are camouflaged with the usual mosaic of colours, yellow, green, pink and blue. These colours are dyed into the fabric before doping, and a similar decoration is painted on the fabric of the fuselage, which is generally dark-greenish in colour.

Armament.—The armament consists of a Spandau gun firing forward through the propeller under the control of the pilot, and a movable gun on a wooden mounting under the control of the observer. The fixed gun is placed close to the exhaust ports of the engine. The mounting of the movable gun is clearly shown in photograph F, and in Fig. 16.

METEOROLOGY

ONE of the most noteworthy features of the work of the Meteorological Committee as revealed by the annual report just issued, is the great development of pressing demands for expert meteorological assistance, and the prospect of still larger demands in the future, as regards the Naval, Military and Air Services. Various projects are noted in connection with the Royal Flying Corps arranged in conjunction with the Office by Maj. G. I. Taylor, R.A.F., and the prospect of a large meteorological organisation in connection with the R.A.F.

"It is obvious (the report continues) that there must be distributing centres in charge of competent meteorologists in various centres as well as London, whether they be under the control of the Meteorological Committee or not. As the Dominions beyond the seas will themselves require some provision for compiling and utilising meteorological information, some co-operative organisation is called for on the part of the Imperial Government in conjunction with the local Governments."

After pointing out how much is left exclusively to private effort, the Committee state:—

IN WAR TIME.

"Now that the weather is recognised to be of primary importance in so many of the affairs of life and the requirements of so many departments of the Navy, the Army, and the Air Force include a knowledge of weather conditions, not only at the surface in the various parts of the globe but at elevations which have up to now been of interest to the meteorologist alone, some more comprehensive organisation is necessary. It is also felt that the steps towards this organisation cannot be postponed until after the war."

In response to an invitation from the Air Board to nominate a member of Lord Northcliffe's Committee on Civil Aerial Transport, the Report continues, the director's name was submitted. Lieut.-Col. Lyons, R.E., and Maj. Taylor, R.A.F., were invited to become members of sub-committees appointed to consider special sections of the provision for civil aerial transport. A home unit has been established to meet the requirements of a number of military services, and has been placed in charge of Capt. C. J. P. Cave, with headquarters on Salisbury Plain. The selection of men for the section and their initial training are conducted at the office.

THE ROLL OF HONOUR

(When an Officer is seconded from the Army, his unit is shown in brackets.)

Published August 29th.

Killed.
Barre, Sec. Lieut. G. B. (R. Dub. Fus.).
Haines, Lieut. A. J., D.F.C.
Lawrence, Sec. Lieut. P. (Leins.).
Lotts, Sec. Lieut. W.
Perring, Lieut. C. R.
Thompson, Lieut. A. R.
Wickett, Sec. Lieut. R. C.

Faulks, Sec. Lieut. H.

Arnold, Capt. P. F. (Lan. Fus.).

Died of Wounds.

Died.

Wounded.

Brokensha, Capt. H.
Casson, Lieut. W.
Cooper, Sec. Lieut. W. J.
Hirst, Lieut. R. C.
Hunter, Capt. J. E. L.

Knight, Lieut. L. A. W. (Worc.).
Potts, Sec. Lieut. J. A.
Thomson, Sec. Lieut. J. C.
Uhlman, Sec. Lieut. J. C.
Walters, Lieut. H. C. W.

Missing.

Askin, Lieut. S. C. J.
Beauchamp, Lieut. F. E.
Beaufort, Sec. Lieut. F. H.
Bryant, Sec. Lieut. S. O.
Cryan, Sec. Lieut. J. S.
Easton, Sec. Lieut. G. C.

Fawdry, Lieut. H.
Hill, Lieut. R. A. G.
Leyden, Sec. Lieut. H. P. G.
Macpherson, Sec. Lieut. J. M.
Sutherland, Lieut. J. L. C., M.C.
(W. Kent).

Published August 30th.

Killed.

Baker, Sec. Lieut. A. W.
Brandon, Sec. Lieut. E.
Cathles, Lieut. G. K.
Hathaway, Sec. Lieut. I. W.

Mitchell, Sec. Lieut. J. K.
Pragnell, Sec. Lieut. S. R.
Reeman, Sec. Lieut. A. O.

Previously Missing, now reported Killed.

Bice, Lieut. E. J., M.C. (Aus. F.C.).

Previously reported Wounded, now reported Died of Wounds.

Leake, Capt. E. G. (Manch.).

Drowned.

Rylands, Lieut. W. P.

Accidentally Killed.

Dunn, Lieut. R. A. (Aus. F.C.).

Lewis, Sec. Lieut. C.C. (Aus. F.C.).

Previously Missing, now reported believed Killed.

Southall, Sec. Lieut. W. P.

Williamson, Sec. Lieut. J.

Missing, believed Drowned.

Barbe, Sec. Lieut. A. E. (H.L.I.).
Mesham, Sec. Lieut. J. H.

Price, Lieut. T. J.

Wounded.

Baker, Sec. Lieut. L. K.
Borrowman, Sec. Lieut. J. J.
Chesters, Sec. Lieut. J.
Dempsey, Lieut. H. E.
Haslam, Lieut. J. A. G. (R.F.A.).
Hook, Sec. Lieut. R. J. (Rif. B.).
Imeretinski, Sec. Lieut. C. G.
MacNeece, Lt.-Col. W. F. (R.W. Kent).

Nudds, Sec. Lieut. G. A. H.
Smith, Lieut. J. L. (Aus. F.C.).
West, Capt. F. M. F., M.C. (R. Muns. Fus.).
Wharton, Lieut. L., M.C. (Aus. F.C.).
Whitney, Lieut. R. K.
Young, Lieut. H. N.

Previously Missing, now reported Wounded and Prisoners of War.
Carr, Sec. Lt. C. V. (D. of Well. R.).

Gregory, Sec. Lieut. R. J.

Missing.

Allen, Sec. Lieut. H.
Burton, Lieut. L. H.
Clack, Lieut. L. A. (K.O.Y.L.I.).
Clarke, Sec. Lieut. E. O.
Dawson, Lieut. S. A.
Flintoft, Lieut. H. T.
Grant, Sec. Lieut. C. F.
Hall, Sec. Lieut. B.
Hartley, Sec. Lieut. H.
Harvey, Lieut. G. S.

Illingworth, Lieut. C. F. W.
Jackson, Lieut. W. E.
Macfarlane, Lieut. P.
Martin, Lieut. F. W. H.
McIntosh, Lieut. V. B.
Misener, Lieut. M. S.
Shipman, Lieut. T. T.
Sinclair, Sec. Lieut. A. S.
Sutcliffe, Lieut. J. E. T.
Webber, Sec. Lieut. W. H.

Prisoner of War.

Lewis, Lieut. R. F.

Previously Missing, now reported Prisoners of War.

Atkins, Sec. Lieut. W. T. I.
Brown, Lieut. E. M.
Burry, Sec. Lieut. H. W.
Chubb, Lieut. J. A.
Collett, Lieut. H. S. (Suff. R.).
Cowan, Sec. Lieut. A. R. (Lancers).
Dunn, Sec. Lieut. R. H.
Dunster, Sec. Lieut. C. H.

Kemp, Sec. Lieut. P.
Mason, Sec. Lieut. H.
Muirden, Lieut. N. H.
Pryor, Lieut. J. W. (S. Lanc.).
Schrivener, Sec. Lieut. H. K.
Weaver, Capt. J.
Wharton, Sec. Lieut. C. E.
Williamson, Sec. Lieut. J. C.

Previously reported believed Prisoner of War, now reported Prisoner of War.

Robson, Lieut. C. C., M.C.

Missing, believed Prisoner of War.

Cross, Sec. Lieut. H. L.

Interned.

Bing, Sec. Lieut. W. L. (Buffs).
Bugge, Sec. Lieut. F. H.

Davidson, Sec. Lieut. L. K.
Pearce, Lieut. L. W. C.

Published August 31st.

Killed.

Angus, Lieut. R. W. F.
Dobell, Lieut. G. L.
Douglas, Lieut. F. W.
Morange, Lieut. L. S.

Morrison, Sec. Lieut. C. O.
Pettitt, Lieut. M. S.
Reynolds, Sec. Lieut. F. W. P.

Died of Wounds.

Knowles, Sec. Lieut. H.

Wounded.

Attwood, Sec. Lieut. E. H.
Boyle, Sec. Lieut. H. J.
Brown, Sec. Lieut. P. L.
Crichtley, Lieut. E. P.
De Salaberry, Lieut. B.
Fleming, Capt. A. L.
Hilborn, Capt. W. C.
King, Lieut. P. G. W.
Lovell, Lieut. F. R.
Meisenheimer, Lieut. G. E.

Murray, Lieut. G. B.
Pennington, Sec. Lieut. W. S.
Saulez, Lieut. J. E. W.
Shrives, Sec. Lieut. A.
Stevens, Sec. Lieut. V. S.
Sutcliffe, Sec. Lieut. C. W.
Tod, Lieut. G. D.
Watt, Sec. Lieut. J. A.
Wilson, Sec. Lieut. F. K.

Missing.

Cullington, Sec. Lieut. A. W.
Hardman, Capt. E. P.

Keepin, Sec. Lieut. W. F.
Patman, Lieut. G. H.

Published September 2nd.

Killed.

Anderson, Lieut. J.
Cangiamila, Sec. Lieut. J.
Kerr, Sec. Lieut. R. W.
Lance, Sec. Lieut. W. G.
Latto, Sec. Lieut. E. C.

MacAllister, Sec. Lieut. G. W.
Manley, Lieut. F. C. C.
Pierce, Sec. Lieut. P. J. E.
Sheard, Sec. Lieut. H. W.

Previously Missing, believed Killed, now Officially presumed to have been Killed.

Brock, Actg. Wing Comdr. F. A., O.B.E., R.N.

Wounded.

Baker, Sec. Lieut. L. C.
Bucknell, Lieut. W. R.
Drummond, Sec. Lieut. E. M. (Black Watch).
Gilmour, Capt. C.
Hornby, Lieut. R. G.
McCowen, Sec. Lieut. E. L.

Pinfield, Lieut. R. G. C.
Prodder, Sec. Lieut. M. R.
Rolph, Lieut. J. G.
Shaw, Sec. Lieut. W.
Sheppard, P.F.O. R. St. John.
Wallace, Sec. Lieut. N.
Warner, Lieut. G. le R.

Missing.

Bracher, Sec. Lieut. H. H.
Brownhill, Sec. Lieut. B. A.
Campbell, Sec. Lieut. J.
Fox, Sec. Lieut. J. B. (Manch.).

Jackson, Lieut. C. R. H.
Madge, Sec. Lieut. W. T.
McIntyre, Sec. Lieut. J. B.

Published September 3rd.

Killed.

Haigh, Sec. Lieut. J. S.
Horton, Lieut. R. E.
Keller, Capt. R. L. (R. War.).
Lee, Sec. Lieut. J. V.

Lewis, Sec. Lieut. C. C.
Meek, Lieut. J. F.
Murray, Sec. Lieut. R. S.
Ulyott, Sec. Lieut. H. N.

Accidentally Killed.

Taylor, Lieut. H., M.C., M.M. (Aus. F.C.).

Died.

Wykes, Lieut. C. E.

Wounded.

Alberry, Lieut. F., D.C.M. (Aus. F.C.).
Frome, Lieut. N. F.
Gladman, Sec. Lieut. C. W. (R.W. Surr.).

Jackson, Lieut. N. W.
Jones, Lieut. S. K.
Munslow, Lieut. F. L.
Stirrup, Sec. Lieut. H.

Missing.

Atkins, Sec. Lieut. C. A.
Bailey, Lieut. E. H. P.
Clayton, Sec. Lieut. E. H.
Connolly, Lieut. S. D.
Cooper, Sec. Lieut. L. G.
Cort, Lieut. A. B.
Coward, Lieut. S. R.
Davies, Sec. Lieut. F. G.
Douglas, Sec. Lieut. R. K.
Edgell, Sec. Lieut. E. H.
Geary, Sec. Lieut. B. C.
Gregory, Sec. Lieut. M. S.
Helmer, Lieut. E. W.

Hind, Capt. I. F.
Irving, Capt. G. B.
Ivens, Sec. Lieut. J. C.
Manzer, Capt. R., D.F.C.
Martin, Lieut. T. C.
McCracken, Lieut. E. C. J.
Metson, Sec. Lieut. G. F.
Milne, Sec. Lieut. R.
Mitchell, Sec. Lieut. J. N.
Moore, Lieut. R.
Risk, Sec. Lieut. J. B.
Walker, Lieut. K. M. (Wilts. S.R.).

Air Fighting in August.

ONE thousand three hundred and nine aeroplanes were reported down during August on all the battle fronts and in the course of raids into Germany by the Independent Air Force and in raids and offensive patrols by Air Force contingents working in conjunction with the Navy, says the *Times* in its monthly summary. A number of these were destroyed or put out of action in the last days of July and only reported at the beginning of August, but if these are deducted the total actually brought down last month is the highest reached since the beginning of the war. The previous highest aggregates are: May, 1,248; June, 1,235; July, 1,179; March, 1,062.

Of the total of 1,309, the Allies claim 1,061 and the enemy 248. The Germans reported that they had shot down 240—the other eight fell in the Balkans and in Italy—but it is not

to be taken that this is a complete record, inasmuch as there were several days when there was no German air report and as the British authorities alone acknowledge that 218 of our machines failed to return—187 on the Western battle front, 14 from raids into Germany, and 17 Naval machines.

Against this loss of 218, British battle-front airmen destroyed 509 German machines, drove down out of control 170 and brought down two behind our lines; the Independent Air Force destroyed 11 and drove 3 down out of control, and Naval airmen destroyed 35 and drove down 20, a total of 750.

On the Italian front, 66 enemy aeroplanes were destroyed, and of these 35 were placed to the credit of British airmen, with a loss of 3 machines. French airmen and gunners destroyed or put out of action 224 German machines, the Americans 6, the Belgians 1, and the Allies on the Balkan front 14.

THE 300 H.P. MAYBACH ENGINE.

Issued by the Technical Department (Aircraft Production), Ministry of Munitions.

(Continued from page 965.)

GUDGEON PINS.—The gudgeon pins are 159 mm. long, slightly bevelled at the end, and are fixed in position in the piston by a single cheese-headed 9 mm. setscrew in the usual way and locked with a split pin.

The gudgeon pins are hardened and ground to three parallel outer diameters, being made of smaller diameter at one end than the other. The centre portion which makes the small end bearing is 38 mm. diameter, and the two ends which fit into the gudgeon pin bosses are 37.5 and 38.25 mm. diameter respectively.

The gudgeon pins are bored 23 mm. diameter in the centre, tapering to 28 mm. at each end.

Floating small end bushes are now fitted to the gudgeon pin in the connecting-rod smaller ends. These floating bushes are made of cast iron of a very soft nature. The effective bearing length of the floating bushes is 93 mm., and their external diameter is 44.3 mm. For lubrication purposes a number of 4 mm. holes are drilled and countersunk on the outside.

The projected area of the small end bearing surface on the gudgeon pin = 35.35 sq. cm., and the bearing surface in the connecting-rod small end = 39.9 cm.

The weight of each gudgeon pin = 1.75 lbs., whilst the cast-iron floating bushes weigh .62 lb. each.

Details of the gudgeon pins and the floating connecting-rod small end bushes are given in Figs. 10 and 11.

Connecting-rods.—Following the usual Maybach design, the connecting-rods are of square section, bevelled at the four corners, and bored up the centre from the big end with a 28 mm. diameter hole, which is screwed and plugged as shown in Fig. 12.

The big-end bearing cap is secured by four 14 mm. bolts, which are screwed 1.5 mm. pitch into the top half of the connecting-rod big ends.

The inner surface of the big-end bearing shells are machined with a screw-cutting tool which leaves a fine pitch screw thread. This provides a serrated bedding for the white metal-lining.

No locking nuts are fitted to the big end bolts, but the square heads of the bolts are drilled, and prevented from becoming unscrewed when in position by a 4 mm. diameter pin, which is long enough to pass through the heads of each pair of bolts.

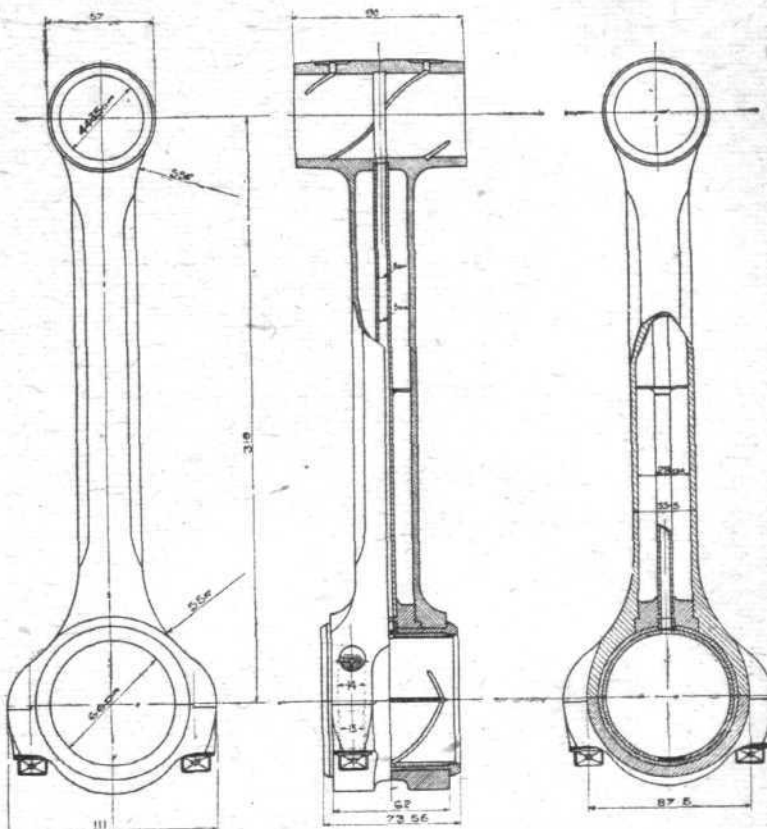


Fig. 12.—Details of connecting rods.

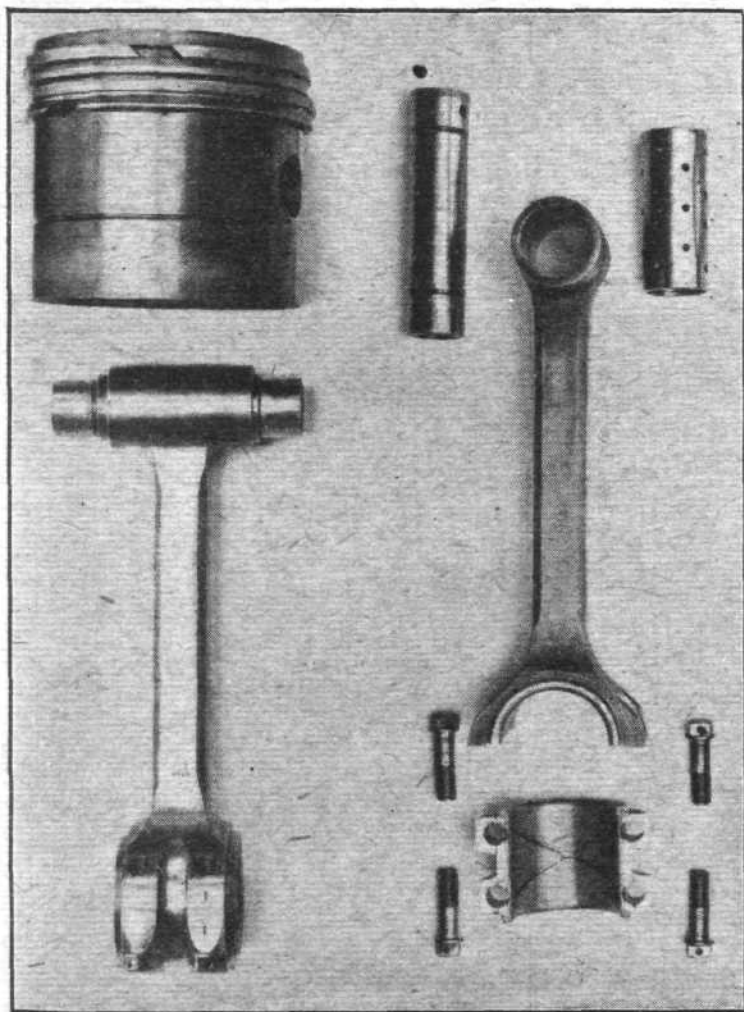


Fig. 11.—View of piston, connecting rod, big-end bearing cap, gudgeon pin, and floating small-end bush.

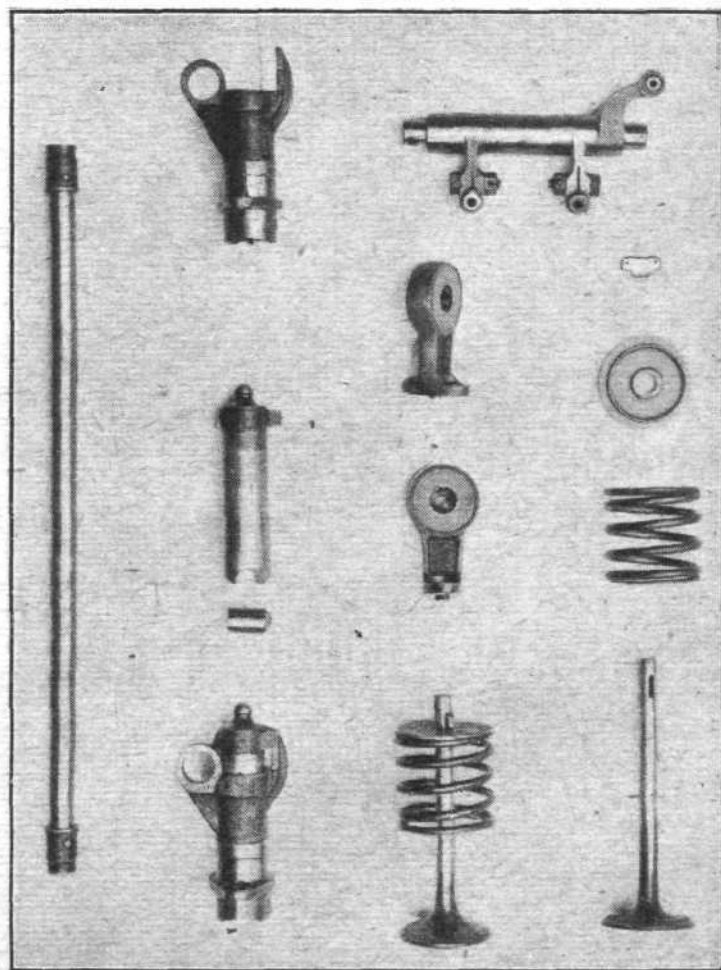


Fig. 13.—Valves and valve gear parts.

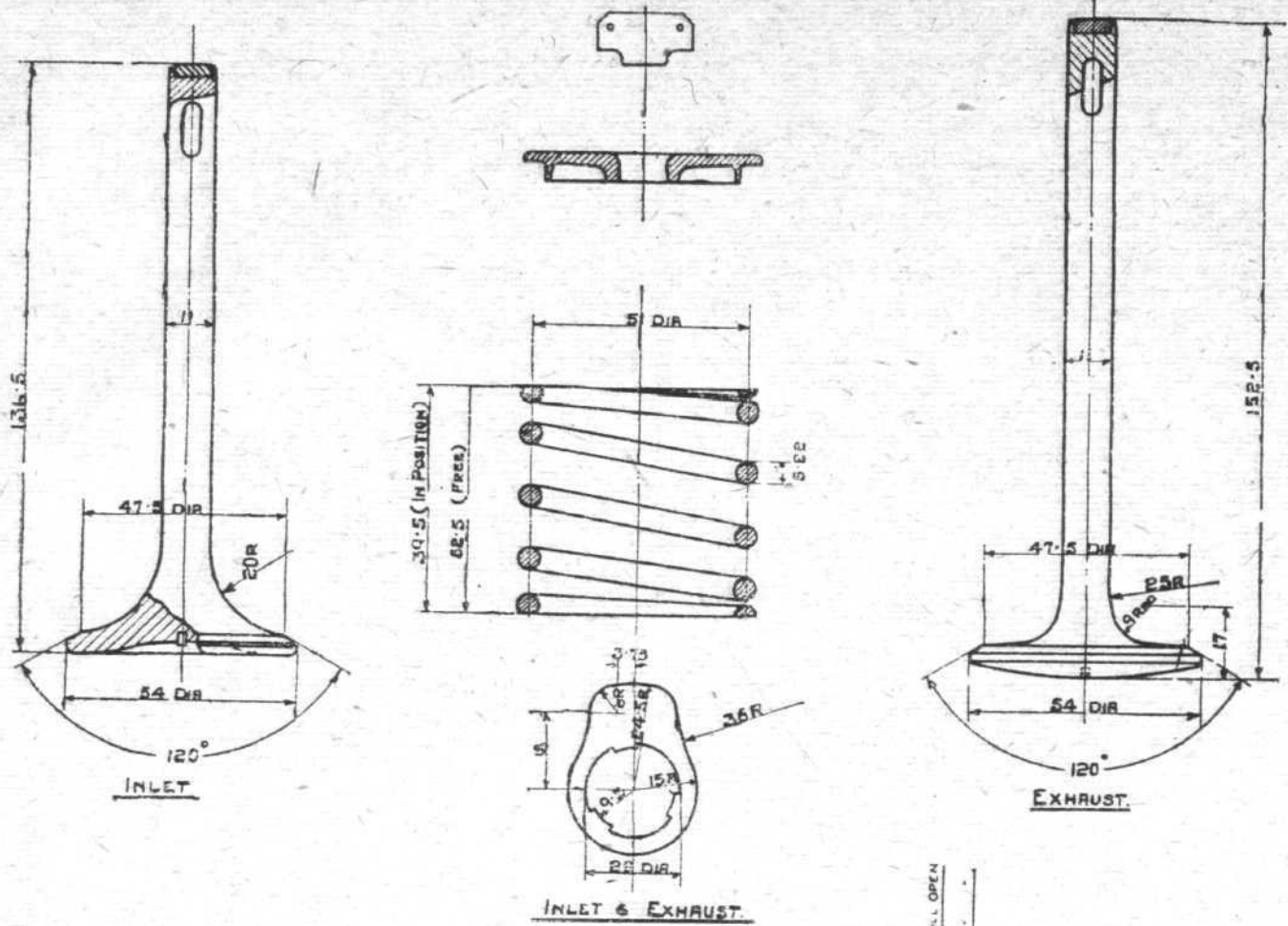


Fig. 14.—Details of valves, cams and valve springs.

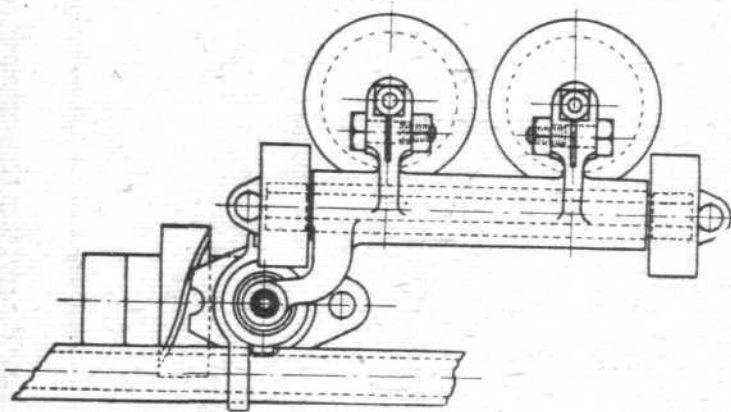


Fig. 15.

SPRING	
EFFECTIVE COILS	3
THICKNESS OF WIRE (DIA)	5.5%
MEAN DIAMETER	51.0%
FREE LENGTH	52.0%
MINIMUM LENGTH	29.0%
135 LBS PRESSURE AXIALLY WHEN VALVE FULL OPEN	
32 TONS STRESS	

WEIGHTS OF RECIPROCATING MASSES.	
WEIGHT OF 2 VALVES	15 OZS.
WEIGHT OF TAPPET ROD	3 OZS.
WEIGHT OF 2 SPRINGS	4 1/2 OZS.
WEIGHT OF 2 SPRING CARS	3 OZS.
EQUIVALENT WEIGHT OF ROLLER	4 OZS.
MULTIPLY BY RATIO OF 35.31	26 1/2 OZS.
	30 OZS.
TOTAL RECIPROCATING MASS AT CAM 2 LBS 3/4 OZS.	

VALVE GEAR OF
300 H.P. MAYBACH AERO ENGINE.

Two helical grooves 2 mm. wide are cut in the big-end bearings. These oil grooves intersect each other on the centre of the bottom half of the bearing, as shown in Fig. 11; the oil ways cut in the top half of the big-end bearing metal are only taken half way on each side.

The little end floating bushes already referred to are lubricated by a 5 mm. steel pipe which is fixed in the centre of the hollow connecting-rods, and the holes drilled in the floating bushes communicate with helical grooves cut in the small end. An annular groove is cut round the centre of the small-end bearing which communicates with the central oil pipe. The method of securing this oil pipe at each end inside the rod, and the steel disc, which supports the centre

are of the same diameter, i.e., 54 mm., and the angle of the valve seatings is 30° in each case.

The inlet valves are machined concave under the head, and are formed with a 20 mm. radius between the valve stem and the head. The exhaust valves are convex in the head, and are made with a compound radius between the valve stem and the head of 9 and 25 mm. The diameter of all the valve stems is 11 mm., the clearance in the guide bushes being .12 mm. (inlet) and .15 mm. (exhaust) (cold). The ends of the valve stems are fitted with hardened steel discs, which are bedded in the recessed ends of the stems.

The inlet valves are 136.5 mm. long overall, whilst the exhaust valves are 152.5 mm. in length. The exhaust

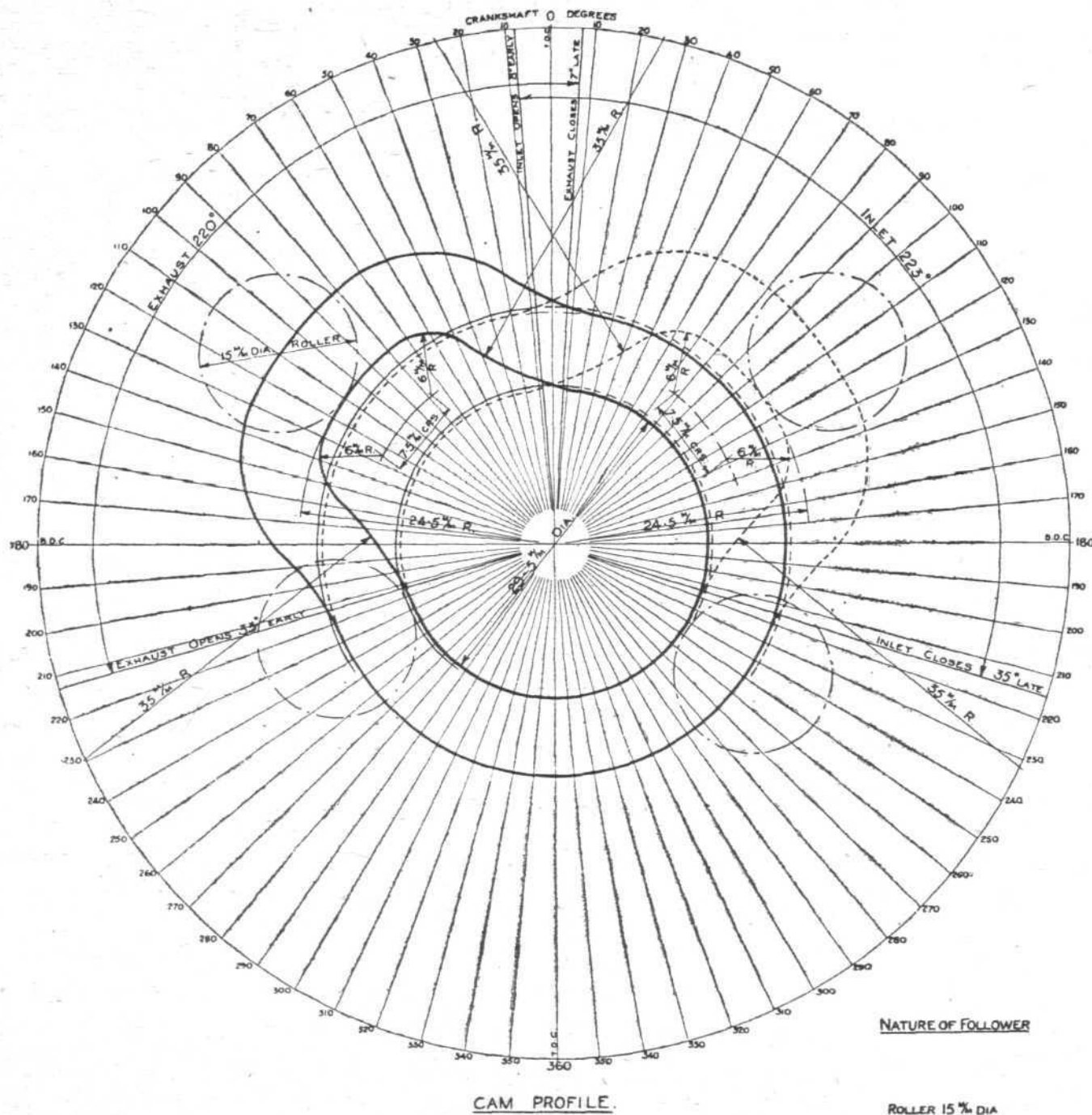


Fig. 16.—Cam diagram and valve timing.

of the oil pipe in the bore, are shown in the sectional drawing.

The total side clearance of the big-end bearing between the sides of the crankwebs = 44 mm., and the float of the small end = 11.8 mm.

Total weight of the connecting-rod complete with floating bush = 8.93 lbs.

Weight of big end = 5.625 lbs.

Weight of little end = 3.305 lbs.

Length of connecting-rod between centres = 310 mm.

Valves and valve gear.—The twin inlet and exhaust valves work vertically in cast-iron valve stem guides in the cylinder heads, and are operated by rocker levers mounted on roller bearings, each pair of valves being operated by a single tappet rod from one of the camshafts in the crankcase.

Valves.—The heads of all the valves, both inlet and exhaust,

valves are made longer to allow for the extra water-cooling space in the cylinder head above the exhaust valve pocket already referred to.

All the valve springs, however, are of exactly the same length, i.e., 52.5 mm. free, and measure 39.5 mm. when in their position in the cylinder, initially compressed with no valve lift. The diameter of all the valve springs is the same, 51 mm. (central diameter of coils), and the gauge of wire is 5.22 mm. in all cases.

The valve springs are fitted with plain collars at the top. These are secured by T-shaped cotters through the valve stems in the usual way. These are also locked in position with small wire clips, which are fitted to the spring cotters through two small holes. The surface of all the valve spring collars is galvanised or plated with a tin or zinc deposit of

CAM DIAGRAMS FOR 300 HP MAYBACH AERO ENGINE

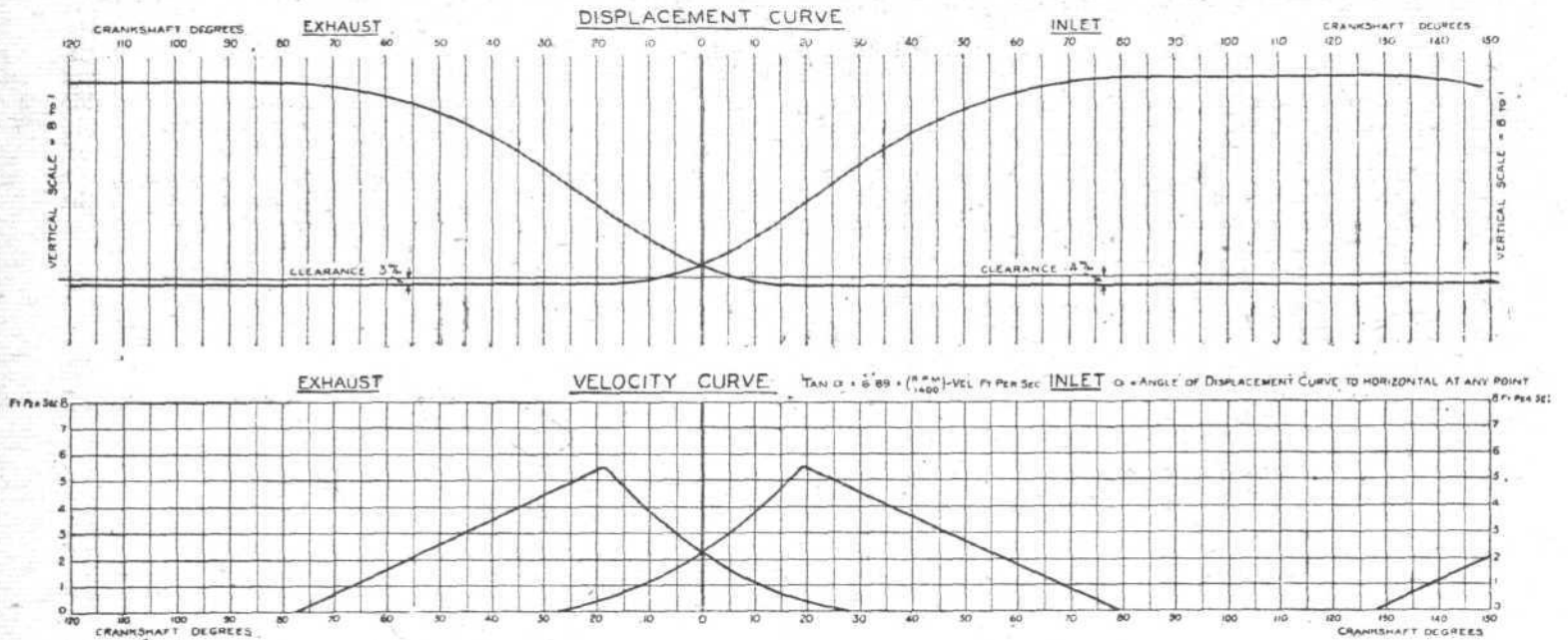


Fig. 17.

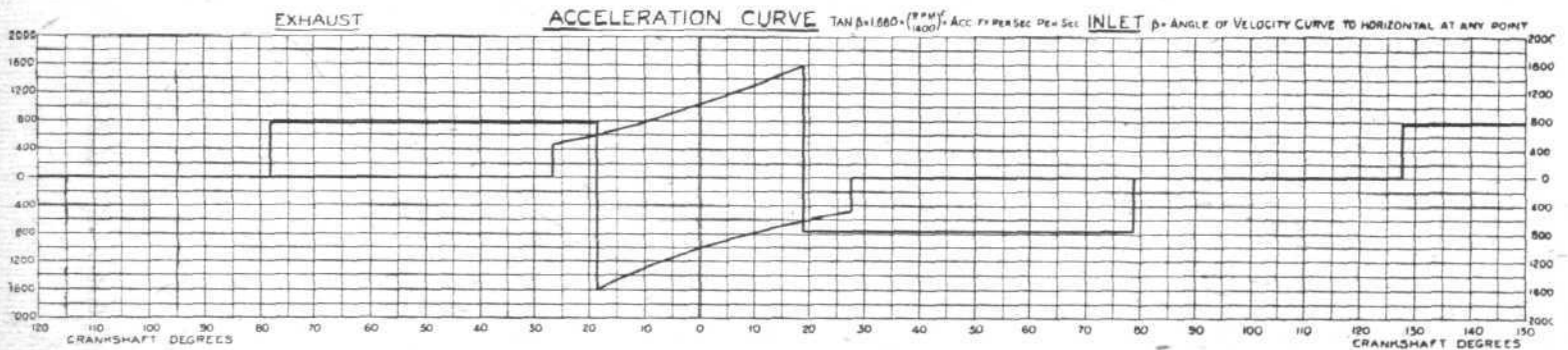


Fig. 18.

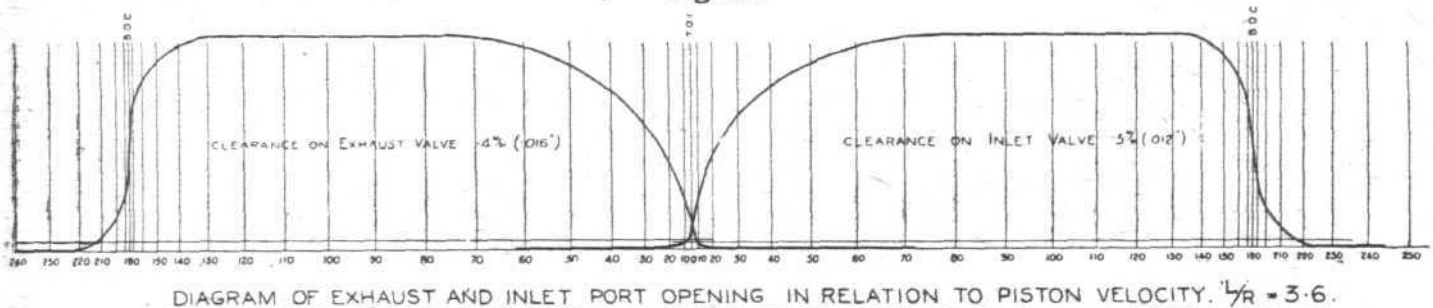


Fig. 19.

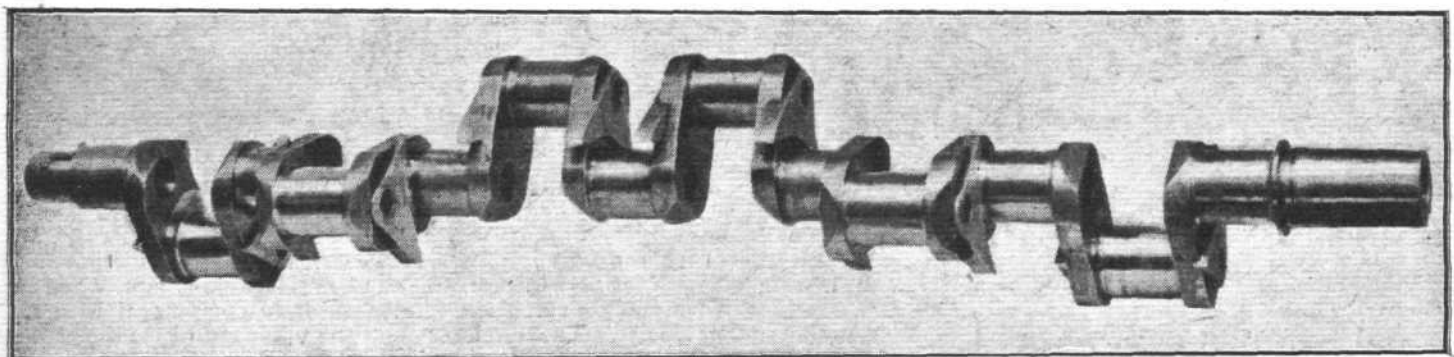


Fig. 20.—Crankshaft.

some nature, apparently to prevent corrosion. This form of galvanised exterior finish is carried out on several other parts of the engine.

Details of the valves and valve springs are given in Figs. 13, 14 and 15.

Valve rockers.—The roller bearings carrying the spindles of the valve rockers are mounted in short brackets, each of which is attached to the cylinder heads by two 8 mm. studs and castellated nuts. The bearing brackets are steel drop forgings, and the roller races are, to a certain extent, per-

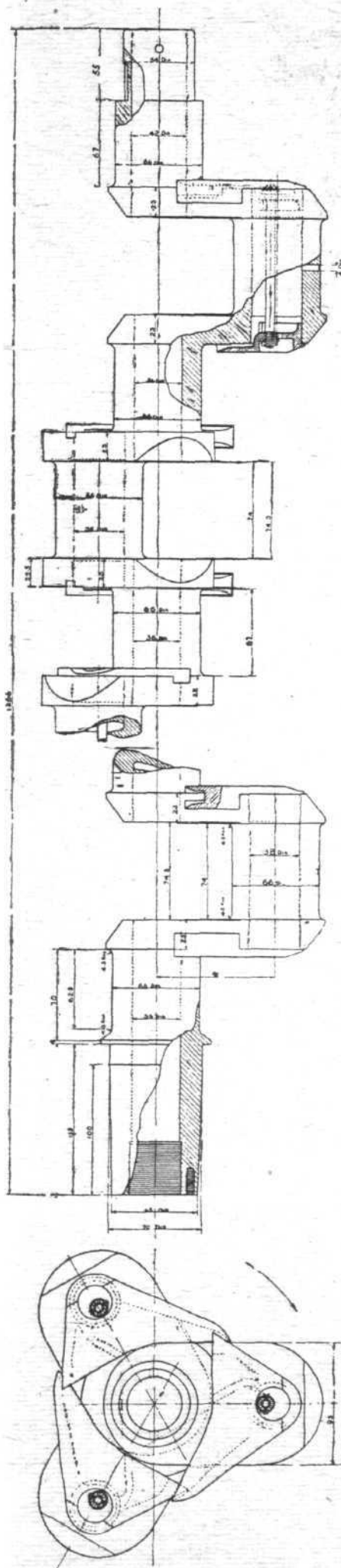


Fig. 21.—Details of crankshaft.

manently fixed inside the recessed heads of the brackets, and are covered by thin steel discs fitted over the front faces of the bearings, these being held in position by a form of mechanical knurling largely used in German aero engine manufacture. This mechanical process takes the form of spinning or riveting over the housing metal of the part by a series of accurately spaced indentations. The effect of this work is shown in the photograph of the roller-bearing brackets amongst the valve parts in Fig. 13.

The hardened steel setscrews for the adjustment of the tappet clearances are drilled with a 5 mm. hole in the centre portion through the squared end only, and the usual form of transverse locking bolt is provided. The method of splitting the lever to provide for the locking of the tappet adjusting screw, however, is carried out in a somewhat unusual way. This is shown in the view of the rocker lever in Fig. 15, from which it can be seen that the saw-cut is made from the tappet hole, which takes the tappet adjusting screw backwards through the centre of the rocker lever towards the rocker spindle.

A steel stud having a hardened hemispherical end, which makes the top joint of the valve push rod, is fitted on the outer lever of the valve rocker.

These steel studs are driven tightly into the levers, and are secured by small steel wire rings snapped over semi-circular grooves cut in the top ends of the spherically-ended studs.

The tappet push rods are made of steel tube 16 mm. outside diameter, and are fitted with hemispherical hardened steel cups at each end. These are fixed to the push-rods by taper pins and weigh .48 lb. each.

Hardly any alteration has been made in the familiar tappet design. The tappets consist of hollow steel tappet barrels, which are plugged at the top ends by hardened steel caps. The tops of these caps are formed with hemispherical heads, which engage with the lower ends of the cupped push-rods.

The hardened cam rollers are held in position by the grooves machined in the bottom ends of the tappet barrels. These grooves are made slightly more than a semi-circle to prevent the roller from falling out. Side movement of the rollers is prevented by the tappet guides. The cam rollers are 15 mm. in diameter, and are bored with a 4.5 mm. hole.

Four small holes are bored radially in the sides of the hollow tappet barrels, which always carry a certain amount of oil, thus providing a very simple, efficient method, of lubricating the tappet guides. These are made of gunmetal, and the general design is clearly shown in the cross-sectional drawings and also in Figs. 13 and 15.

A vertical lug is provided on the top of each tappet guide, which forms the guide for the tappet barrel, and prevents it from rotating. Three oil grooves are machined inside the tappet guides.

Cams and camshafts.—Both the inlet and exhaust cams are of the same profile, although the valve lift is slightly greater for the exhaust valves, according to the valve lift diagram reproduced in Fig. 47, which has been calculated from the actual valve setting of the engine under test. This difference is due to the unequal tappet clearances. Details of the cam design are given in Fig. 16. The cams are made in pairs machined from solid forgings. Each pair of inlet or exhaust cams is fitted to the camshaft separately. Each camshaft is provided with three key-ways, which are machined along the whole length of the shaft. The cam blocks are made with three keys cut inside the hole which is bored in the cam blocks, the keys being solid with the cams. The cam blocks are also fixed to the camshaft by taper pins to prevent lateral movement. The central portion of each cam block between each pair of cams is machined to a diameter of 49 mm. x 16 mm. in width. These portions of the cam blocks form the journals of the camshaft bearings. They run in plain phosphor-bronze bushes let into the top half of the crank chamber, and helical oil grooves are cut in the face of the bearing journals on the camshaft. Each cam block is also fixed in position in the camshaft by one 5 mm. setscrew, which prevents the cams from moving laterally in the key-ways.

The five bronze bushes forming the camshaft bearings are pressed into the crankshaft bearing webs of the crank chamber. The front and rear camshaft bearings are fitted with a flange, and are detachable; they are twice the width of the other three on account of the camshaft driving gears which are fitted on the front end of the camshafts, and the magneto driving gears, &c., which are fitted to the rear ends of the camshafts.

The setting of the valves is shown in the accompanying diagram (Fig. 16), which shows the following valve positions, viz. :—

Inlet valve opens, 8° E.; inlet valve closes, 35° L.; exhaust valve opens, 33° E.; exhaust valve closes, 7° L.; period of induction, 223°; period of exhaust, 220°.

Further details of the valve gear and cam design are given in the list of data at the end of this report, and in the following diagrams (Figs. 17 and 18).

Crankshaft.—Details of the design of the crankshaft are given in the dimensioned drawing in Fig. 21, and a perspective view of the complete crankshaft is shown in Fig. 20. The crankshaft runs in seven plain bearings lined with anti-friction metal of the usual formation. All the journals are 66 mm. in diameter. The diameter of the crankpins is also 66 mm. The crankwebs are all of the same section, being 23 mm. in thickness and 95 mm. in width across the face. All the journals are bored 36 mm. diameter. The crankpins are bored 39 mm. diameter, the ends of the holes being plugged with the centrifugal oil scoops characteristic of the Maybach engines. (Details of these are dealt with later in the notes on lubrication.) The rear end of the crankshaft carries the extension shaft, on which is mounted the wireless dynamo driving pulley, which embodies a friction clutch. This design of wireless pulley is a standard German engine fitting. Full details of its design and construction have already been issued in previous reports.

The extension shaft referred to above is a driving fit in the rear end of the crankshaft, which is bored 42 mm.; the extension shaft is locked by a 7 mm. taper pin. Two centrifugal oil thrower rings are machined on the extension shaft. These details are shown in the general arrangement of the engine.

The main driving bevel gear is fixed to the rear end of the crankshaft by a key 8 mm. wide \times 5.5 mm. deep, half sunk in the shaft.

An interesting point in the design of the crankshaft is found in the method of fixing the flange to which the propeller hub is bolted. The construction is clearly shown in the sectional arrangement of the propeller hub in Fig. 22, from which it will be seen that a slight taper, 1 in 33.3 mm., is machined on the front end of the crankshaft, on to which the propeller hub flange is very tightly driven. No key is fitted to the taper, but a grub screw 10 mm. diameter is

screwed into the front end of the flange, the hole being drilled half in the flange and half in the crankshaft.

The grub screw is locked by the flanged head of a large plug 40 mm. diameter, which is screwed into the hollow front end of the crankshaft. This flange, to which the propeller hub is secured by eight 14 mm. bolts with countersunk heads, is mounted on a large single race ball-bearing, 132 mm. outside diameter, behind which is fitted the double thrust ball-race, 108 mm. diameter on the ball centre diameter.

On the front portion of this propeller hub carrying flange is mounted a double oil thrower ring, which is driven on to the outer diameter of a split collar or bush as shown in Fig. 22. The driving gear for the camshafts is machined on this propeller hub flange; the teeth of the gear are integral with the flange, hence the splitting of the bush which carries the double oil thrower rings.

(To be continued.)

THE WORK OF THE R.A.F.

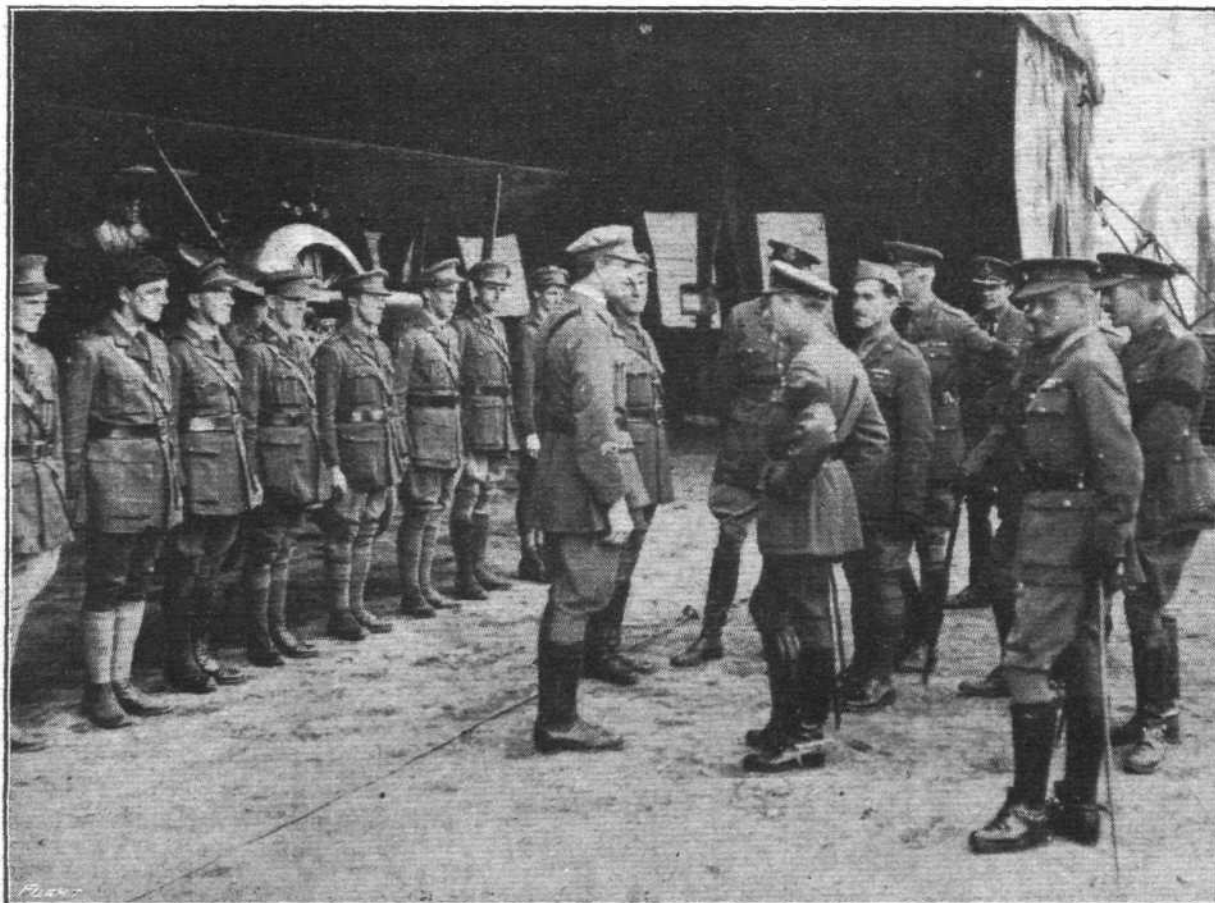
DURING the present offensive operations in France the Royal Air Force units have been very busy, although their activities have not come in for a great deal of publicity. The following incidents, taken at random from the Royal Air Force records, may be regarded as typical:—

A pilot flying a scout machine over the German lines was able, unperceived, to tail on behind a hostile formation of nine machines just leaving its own aerodrome. He followed, without being noticed, till the Hun formation met a British artillery observation machine on a lower level. Two of the German machines left the formation and dived to attack. Instantly the following English pilot swooped on one of them, getting in a burst from his machine-gun, which caused it to side-slip into and interlock with its companion. Following them he put in another burst, which sent them both crashing to earth in flames.

That night two British machines detailed for the purpose of watching a German aerodrome from which night-bombing machines worked sighted a hostile machine preparing to land. The enemy manoeuvred frantically, vainly trying to evade the night hawks. Round and round the aerodrome they circled, until finally, when quite low down, one of the British pilots was able to bring his machine-gun to bear. The German landed—but as an inanimate part of a crashed and blazing machine.

In the afternoon the enemy, being hard pressed by Allied troops and fearing for the safety of his observation balloons, began to move these back. A British scout sighted two of the "sausages" being towed by teams of horses. He was flying low, and a heavy fire was directed at him from the ground. Heedless of this, however, he dived still lower, and succeeded in setting one of them on fire. Driven from the remaining balloon by the increasing hail of bullets, he next directed his attention to an anti-tank gun. The gunners hastily limbered up, but his fire stampeded their team, and the gun upset in a ditch. By this time he had been wounded twice, but, noticing various parties of infantry concentrating in the vicinity, he attacked and dispersed them before returning to his aerodrome.

Another pilot, seeing a party of Germans collected in the open, descended to investigate, and found that they were exulting over a British machine that had been brought down in their lines. A bomb released from a height of only 100 ft. effectively dispersed them, after which he dropped three more bombs on other parties of troops near by. During this performance, however, his machine was so severely damaged by rifle fire that he soon had to descend alongside an English cavalry outpost. Not yet having exhausted his enthusiasm, he procured a rifle and put in some dismounted cavalry fighting before borrowing a horse and returning to his aerodrome.



THE KING'S VISIT TO FRANCE.—With Australian Air Squadron. In the foreground, behind King George, is General Birdwood.

Ministry of Information.

QUIRISMS FROM THE FOUR WINDS

FLIGHT.

By HERBERT J. HALL.

Power, speed and power
And the rush of a furrowing sea,
Green sea that bursts to flower
For the joy of the newly free.

Roar of the engine churning,
Sweep of sustaining wings,
Wings that with mighty spurning
Lift above earthly things.

Into the arms of danger
Sped by the taunt of a dare
Leaps my aerial ranger
Up the long spirals of air.

Up where the sky walls are thinning
Higher and higher I creep,
Silence of heaven beginning
Like the beginning of sleep.

Up to the bounds of all flying,
Helpless at last and grown still,
Through with the lust of defying,
Knowing the infinite will.

Out of the cold sky falling
Swings the long earthward glide,
Back to the sea's faint calling
Sinking in circles wide.

Peace from an endless striving,
Joy of a perfect control,
Wonder of human contriving,
Fullest accord of the whole.

Soft is the blue sea's inviting,
Friendly and quiet it lies,
Waiting my slant plane's righting
Out-of the yielding skies.

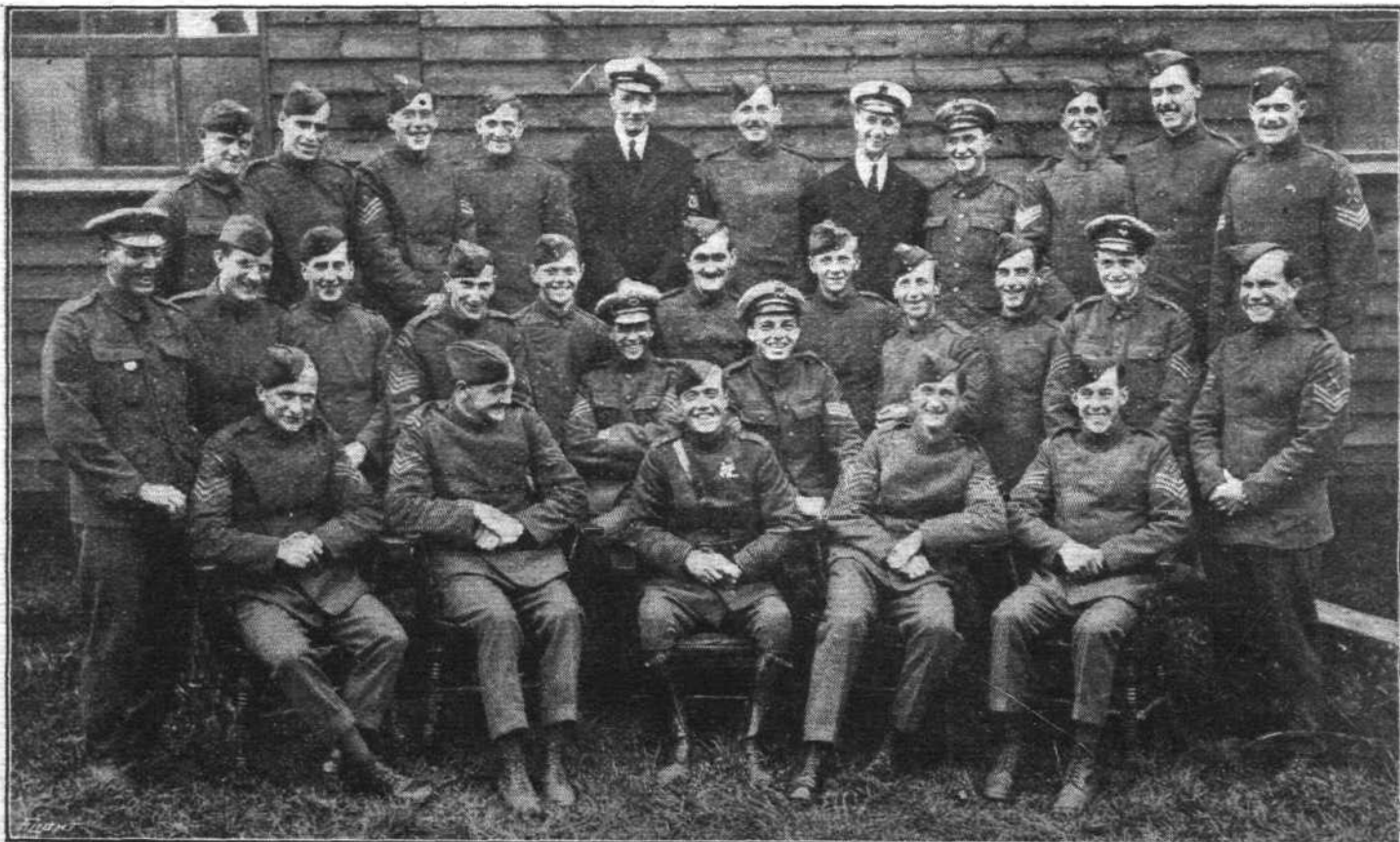
(From *American Flying*.)

FROM Turkish reports there would appear to have been no less than four air raids upon Constantinople within eight days ending the night of August 27th-28th. At the time of writing, never one word, so far as we can discover, has been published by the Allies of these happenings. Wonder why not. Constantinople folk probably know all about it, and even the Germans also.

QUAINT ideas prevail in methods of secrecy apparently without any sense of proportion whatsoever. We say *apparently* advisedly, as we notice a curious little bit of information is given by the *Petit Journal* last week, and reproduced in this country, in an article on special tasks carried out by pilots. For the first time, we believe, in print, it is therein related how the aviators Vedrines, Guynemer, Billard, and others have accomplished the most important missions in enemy territory, by conveying intelligence agents, whom they pick up and bring back when their mission is accomplished.

YET bombing Constantinople four times in eight days must remain an inviolate secret, so far as Britain is concerned!

By the appointment of Mr. John D. Ryan, the present United States Director of Aircraft Production, to the post of Assistant Secretary of War, with the entire United States Army aeronautical programme under his control, is distinctly a further move in the right direction for ensuring the most strenuous air strafing of the Huns. Although the move up is hardly what most hard-headed thinkers consider adequate, it is another step towards an Air Minister, with a place in our Allies' Cabinet, which for the moment does not quite fit in with the ideas held by President Wilson, who is without much doubt influenced in this opposition by the views which he has absorbed from the heads of the U.S. Navy and Army. But Mr. Ryan has done so well with his job in the past that before long a broader vision of the position may easily come about. In the meantime, without doubt, things aviatric are humming away yonder.



AT THE WIRELESS SPORTS CLUB MEETING AT AN R.A.F. DEPOT.—The Sergeants' Mess believes in "Keep Smiling," with S.O.S. as a wash-out.

MORE and more is it being realised that the creation of the Air Ministry in this country was the only solution. It has curious ways of cropping out, this independence of the Air Force. Take its application to Ireland alone, where, as we have recently had occasion to point out, recruiting for the R.A.F. is having quite a mild little "boom" all to itself. And why? Because those in charge of the campaign have diagnosed the inclinations of the Irish aright, and have been careful in the following manifesto to point out to the "bhoys" that the R.A.F. is very much also the I.A.F. It is in some respects quite remindful of the early recruiting stunts which had a vogue this side of the Irish Channel. Here's the "explanation":—

"ENLISTMENT IN THE AIR FORCE.

A MISAPPREHENSION CORRECTED.

"Through a misapprehension a number of intending recruits for the Air Force were refused acceptance on the ground that being Grade 1 men they were fit for and should join some branch of the Army. This mistake was due to the fact that in Great Britain such a regulation is enforced. In Ireland, however, as long as the Recruiting Council are in control of operations, EVERY Irishman who wishes to join the Air Force will be accepted if he belongs to any of the three Grades 1, 2 or 3. If he fails to pass in any of these grades he will be given a certificate which will be a complete exemption from all future military requisition.

"The Air Force is not a branch of the Army or the Navy, but IS AN INDEPENDENT SERVICE. It is not subject to the control of the War Office, and NO RECRUIT FOR THE AIR FORCE CAN BE TRANSFERRED to the Army or Navy except at his own request.

"Intending recruits may apply to any of the Irish Recruiting Council's offices."

PRETTY cute and daring were the methods, as related in the *Daily Telegraph* from Milan by Mr. A. Beaumont, of some Austrian pilots in their endeavour to deposit a sitting of eggs on Italian towns with a minimum risk of retribution from the anti-aircraft defences. It appears, however, that this new war ruse was attended with but little luck. The idea was to follow, at dusk, an Italian Caproni squadron, which had thrown bombs on an Austrian aviation camp at Comina. Large machines of the Brandenburg type, under cover of darkness, closely followed the returning Italian squadron, and thus being momentarily immune from anti-aircraft guns, they managed to cross into Italian territory. Some of these machines were to have continued their flight, and to have thrown bombs on Padua, following a pre-arranged plan of bombarding the towns in the Venetian Plain. One of the machines succeeded in approaching Padua, but having missed its route, in returning was stopped by the barrage fire, and, being stuck by a shell, fell into the Lagoon of Chioggia, where the occupants were made prisoners.

"INFANTRY AIRMEN" is a coined phrase emanating from Berlin, for describing the pilots who have been supplying the German lines with ammunition and food under difficult conditions for both the suppliers and supplied.

It is gratifying to have the assurance of Lord Mayor Sir Charles Hanson, with the Italian poet d'Annunzio as his authority, that Venice has not suffered so much damage from enemy air-raids as might have been anticipated. Sir Charles states that the city is heavily camouflaged and protected, but, with the exception of a few buildings, it was gratifying to notice that no visible damage had been done.

It is no secret, of course, that many British officers are over in the United States instructing our Allies in bomb-dropping, and indeed every phase of modern warfare is learned from actual experience at the Front. The best of good feeling prevails between our men and the Americans, who are nothing if not hospitable; but the one thing which British training officers find a little difficult to endure is the all but universal attitude of the Americans towards the war, in so far that they are apt to speak of it as having only just begun because they are now in it.

On the other hand, the charming inconsequentiality of the native American and his lack of respect for caste distinctions may at times serve a useful purpose in the case of any British officer who may be inclined to preen himself overmuch on his rank or birth. Apparently any American considers himself entitled to address any stranger without introduction, and the said stranger, if new to the ways of the inhabitants, may find himself turning the cold shoulder to a really "big bug." In a letter to hand, for example, from a British

officer attached to a Texas training camp, he describes a rencontre with an American brigadier-general and a civilian in a Pullman car. The said British officer was duly polite to the general, but took no notice of the civilian. At length, however, the civilian chipped in with, "Say, officer, kin you tell me . . . ?" and so forth, and the Briton answered his questions in a somewhat parrying mood. Eventually both brigadier and civilian alighted at a roadside station, and then an American officer came up to the man from home and said: "Say, d'you know who that jink was? He's Elihu P. Schenk, the second biggest guy in the States, Governor of Ohio, and candidate for the Presidency of U.S.A." And our officer had taken him to be a commercial traveller!

THE same officer sends an amusing account of camp life out West. "Talking of American curiosity," he writes, "let me give you a simple conversation—one of hundreds daily in which I am the reluctant party. Enter a total stranger, who may be anything from a lumber king to a soda-fountain tender. Seizing me firmly by the top button of my tunic (or the second one if he cannot quite reach) he says: 'Say, guess you find it tol'able warm down here comin' from Canada, dontcher?' 'Yes, but I'm not a Canadian, you know.' 'Oh, aintcher?' 'No, I'm British.' 'Oh' (pause). 'You've not been to the battle, I reckon.' 'Oh, yes, I had two years in France.' 'Oh, is that so?' (incredulously). 'What's this for anyways?' 'That's just a whistle cord.' 'Oh, and this?' (And so on, through every detail of my uniform and badges.) Finally: 'Waal, I guess our boys have got it. Kaiser beat. Glad t'ave metcher.' (Exit.) Quite a number of people have taken my service chevrons for a corporal's badges (they wear them upside down in the American army). On the other hand, three stars on the shoulder are the insignia of an American general."

THE Chicago packer is supposed to use "every part of the pig but the squeal," but the weirdest by-product that we have seen for some time is the pyjama suit used by an aircraft manufacturer, made out of aeroplane linen intended for the wings of the old Deperdussin machines. In order that an accidental tear should not spread, raised strengthening webs were woven on the linen, making a neat checked pattern with squares measuring about eight inches each way. This put the material out of court of use as shirts, but it does very well to sleep in, though the effect would be startling on an air-raid night, if the owner had to reveal himself?

THE cover of the musical score of a comedy now running in London portrays an aeroplane excelling in originality anything that we have seen up to the present. The left hand wing is of the clipped speed scout type, with one set of struts only, but the right-hand wing spreads magnificently out of the picture after manifesting two sets, and seems to have every intention of rivalling the span of a Handley-Page. As equipped the machine should show exceptional manoeuvrability. The happily unconscious pilot waves a handkerchief, airily oblivious of the fact that his axle has dropped off, and nothing is left for him to land upon except a couple of wheels, apparently gummed on to two diamond-shaped projections. The whirling propeller is indicated by one of those flourishes that recall the penmanship of the elderly gentleman who used to stand in the Farringdon Road selling gold nibs at ten-a-penny!

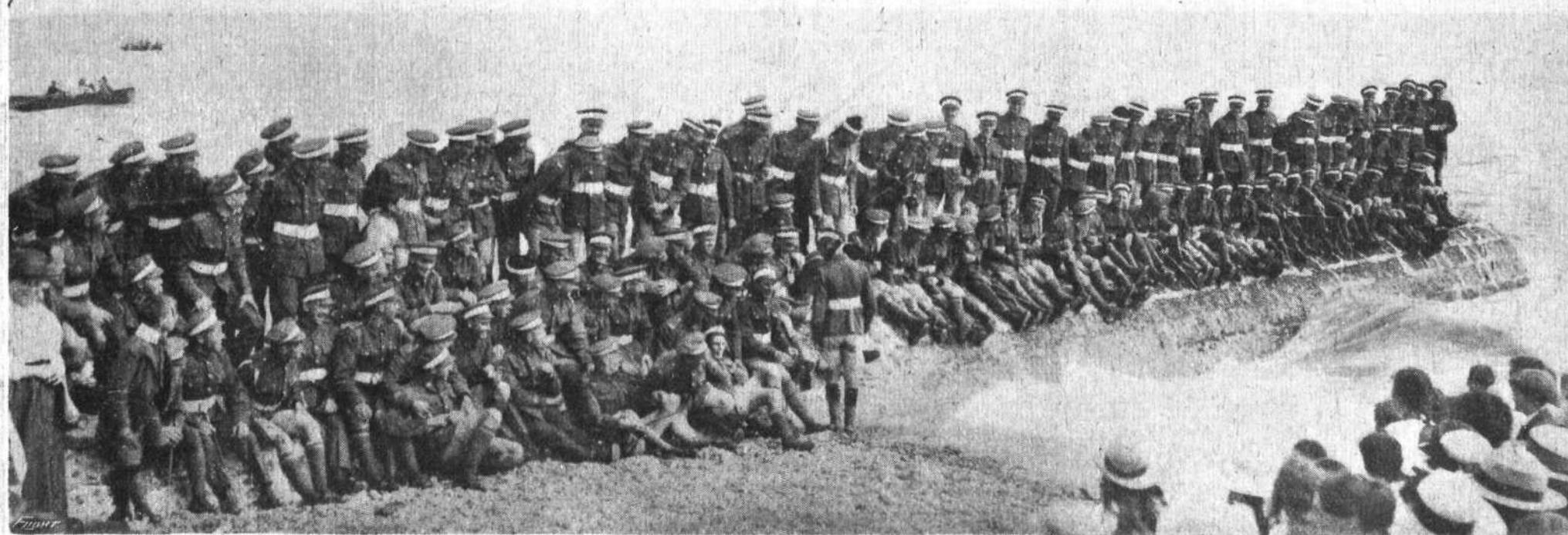
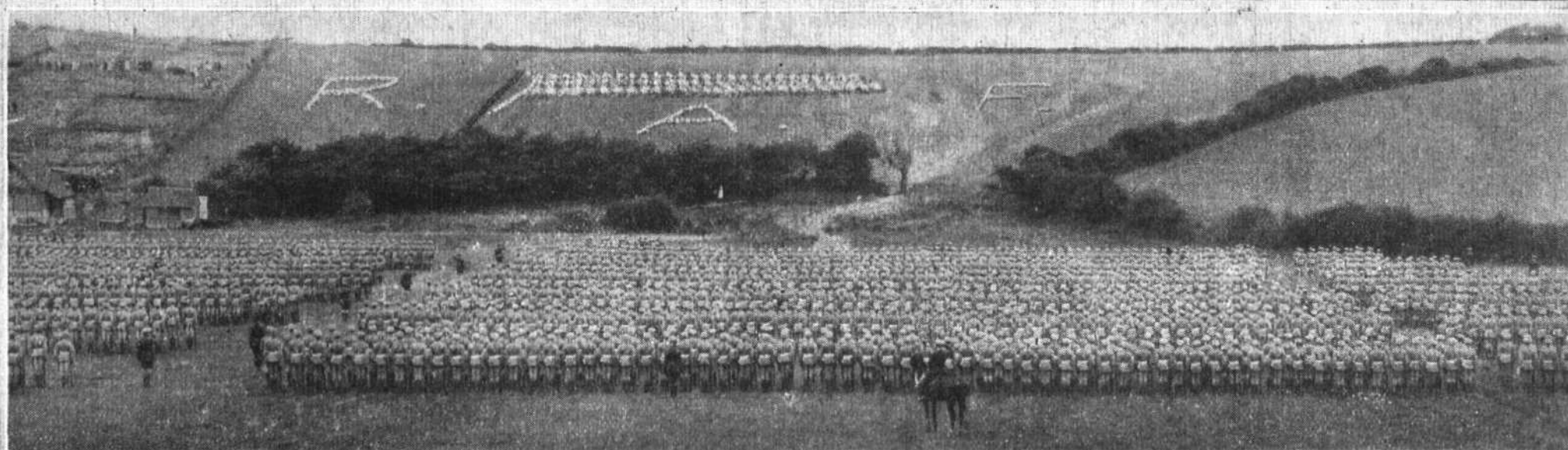
That aeroplane mail services in the United States are regarded seriously is apparent from the regulations recently issued by the Postmaster-General, Mr. A. S. Burleson. Every conceivable contingency has been provided for, and a concluding paragraph reads:—

"Railroads are requested to ask all employees to keep watch for aviators landing in isolated regions and to furnish assistance. All trains and steamships are required to take on stranded aviators, and also to stop at whatever point the aviator may desire for the purpose of leaving the train or boat."

It was Barrie's self-educated railway porter who came to the conclusion that womenfolk were strange creatures, and wondered that nobody had thought to write a book about them. We overheard a willowy damsel replying to her swain, who thought the low-altitude stunting of an aviator dangerous. "Yes, but don't you see, he's all right anyway. He's flying over the rhubarb field!"

We cannot quite make out whether she thought that the rhubarb stalks would break the fall, or whether it would be a handy medicament in case of a forced landing.

0426



0431

THE KING INSPECTS R.A.F. CADETS.—Top photograph: The parade ground as the King viewed it. The Cadets on opposite hill formed the flag to the letters R.A.F., while in the foreground were some thousands in formation for inspection. Below: Some of the Canadian Cadets take the sea air.

"Flight" Copyright.

R.A.F. CADETS INSPECTED BY THE KING.

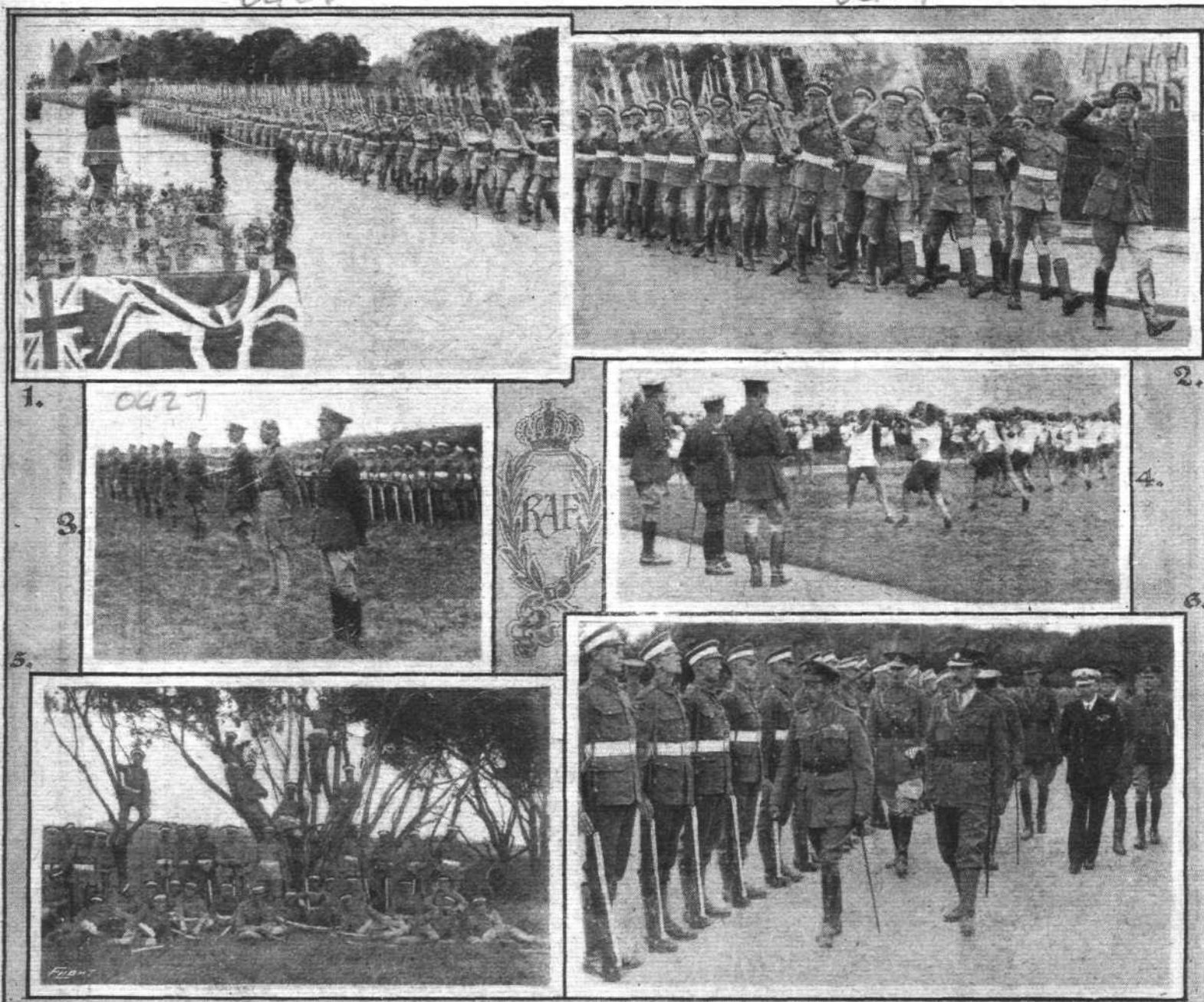
"The King, attended by Commander Sir Charles Cust, Bt., R.N., and the Earl of Cromer, left Windsor Castle this morning by special train, and inspected the Royal Air Force Cadet Brigade, under the command of Brig.-General A. C. Critchley. Brig.-General J. G. Hearson, Director of Training, was in attendance during the morning."

A simple announcement in the *Court Circular* of August 30th, but what a wonderful morning it was in that little English town somewhere near the sea. From the time that His Majesty was received at the railway station by the Mayor and General Critchley, there were two hours crowded with movement and enthusiasm. After inspecting the guard of honour, which comprised cadets from all corners of the Empire, the King motored to a stand erected on rising ground. There, drawn up in military formation, were thousands of cadets, all young men, ranging from 18 to 30 years of age—the flower of the Empire's youth. On the opposite side of the hill was a living khaki flag made up of men who have passed through the brigade. On three sides were arranged the letters R.A.F. At a word of command a ripple ran across the flag and then it suddenly changed to the blue and

red colours of the R.A.F. The initials also changed from their original colour to black and white. Then the whole piece with wonderful precision slowly moved up the hill and disappeared from sight over the top.

Thousands of youthful voices blended in the National Anthem, and then the massed cadets went through their drill—a wonderful spectacle, the whole brigade seeming to move as one man. Having inspected the cadets, His Majesty drove to the saluting base on the sea front, and the cadets marched past in companies, the short, brisk step and the long swing of the arms contributing to make a most impressive exhibition, arousing in the crowds which lined the parade a high pitch of enthusiasm, especially when one of the companies, led by Capt. H.R.H. Prince Albert, reached the saluting base.

Afterwards His Majesty witnessed a display of massed boxing and physical drills by some of the recently joined recruits and subsequently drove to the various wing headquarters in the town, officers' messes, cadets clubs, instruction school, and other selected centres, proceeding afterwards to the station for the return journey to Windsor.



THE KING INSPECTS R.A.F. CADETS.—1. As the Cadets passed the Royal stand the King took the salute. Note the high swing of the arm of the marching cadets. 2. Capt. Prince Albert, at the head of his company, salutes the King, his father. 3. Capt. Prince Albert, with his brother officers, on the parade ground. 4. Cushion punching. The King and Gen. Critchley watching a very energetic display. 5. Canadian Cadets in picturesque formation. A rest between drill display. 6. The Guard of Honour at the railway station consisted of Colonials all well over 6 ft. high. The King was followed by Gen. Critchley (in command), Commander Sir C. Cust, &c.

Personals.

Casualties.

Sec. Lieut. OLIVER BELL, R.A.F. (I.F.), who was killed in action on August 24th, was the younger surviving son of William Bell, of Disley, Cheshire, aged 19.

Lieut. CHARLES MAURICE BÉRANGER (French Flying Corps), Croix de Guerre avec palmes, after nearly four years' service who was killed in action on June 1st, aged 32, was the eldest son of Monsieur and Madame Charles Béranger, 43, Avenue Montaigne, Paris, and husband of Jeanne Béranger (née Clerc).

Lieut. EDGAR BRANDON, R.A.F., who was killed on August 11th, was the third son of the late Edgar Brandon and of Mrs. Brandon, of Newlands, Bedford, and was educated at Bedford Grammar School. At an early age he went to Tasmania, where he was doing well. He obtained a year's leave to come home, but it took him five months to reach England, where he landed in October, 1917. He was in the Inns of Court for a time, and then got a commission in the R.A.F. as observer. He had been at the front only a few weeks when he was killed.

Sec. Lieut. ALEXANDER CLAUD GARDEN BROWN, R.A.F., reported died of wounds May 5th, received May 3rd while flying on high reconnaissance, was the fourth son of Mr. A. F. G. Brown, Mottistone House, I. of W., aged 27.

Sec. Lieut. THOMAS GODWIN HOBBS, who died of wounds received in action on August 23rd, was born on September 19th, 1888, at Gosport, Hants, and was educated at St. Edward's School, Oxford, where he distinguished himself at all games and sports. After a short business life he took up farming in Canada in March, 1909. When war was declared he at once volunteered, began his training at Winnipeg in October, 1914, and went to the front with a Canadian contingent early in 1915, taking part in some of the big battles of that spring. He there contracted trench fever, and for the next two years suffered from malaria and rheumatism, and spent most of that time in hospitals. When he was discharged as fit he obtained a transfer to the R.A.F. early this year, and in May qualified as a pilot, proceeding to the front on June 12th. He was married last May to Miss Patricia Miles, of Sellindge, Kent.

Lieut. JAMES BRUCE JAMESON, R.A.F., who was killed in action on August 24th, was the youngest son of Major and Mrs. T. M. Jameson, Rye, Sussex, aged 25 years.

Lieut. LAIRD KIRWAN, South Lancs. Regt., attd. R.A.F., who was killed on flying duty on August 20th, after four years' service, was the only son of John and Caroline Kirwan, of 10, Lower Grosvenor Place, S.W., and 84, Hatton Garden. He was 24 years of age.

Sec. Lieut. LAURENCE JAMES LAVINGTON, R.A.F., who was killed in action on August 22nd, aged 18, was the younger son of Mr. and Mrs. A. J. Lavington, Maesmor, Gordon Road, Claygate.

2nd Lieut. T. R. A. MAY, R.A.F., who was killed in action on August 9th, aged 19, was the younger and only surviving son of the Rev. F. Granville and Mrs. May, of Cardynham, Bodmin, his elder brother, Sec. Lieut. Paul Archer May, Devon Regiment, aged 19, having been killed in action last year. He was educated at Burnham and at Sherborne (School House), entered the R.N.A.S. in August, 1917, and obtained a first-class pilot's certificate last July. He was sent to the front on August 7th, and was reported killed two days later.

Major HERBERT MUSGRAVE, D.S.O., R.E., who was killed on June 3rd, was born in May, 1876, the youngest son of the late Sir Anthony Musgrave, G.C.M.G., and Lady Musgrave, daughter of Mr. David D. Field, of New York. He was educated at Harrow, and obtained a commission in the Royal Engineers in March, 1898. He served in the South African War, 1899-1902, during which he was mentioned in despatches twice and received the Queen's medal with five clasps and the King's medal with two clasps. From June, 1901, to September, 1904, he was employed with the South African Constabulary, and he became Captain R.E., in March, 1905, and in the Royal Flying Corps at the end of April, 1913.

From August, 1908, for four years he was D.A.A. and Q.M.G. at Malta, and for a month in 1914 he was Deputy Assistant Director of Military Aeronautics at the War Office (temporary). He had served in the present war from 1914, had been once wounded, and in February, 1915, was awarded the D.S.O. In March, 1915, he became D.A.Q.M.G. He returned to France at the end of last year on the Staff, and fell in action on June 2nd last. Major Musgrave married, in 1915, the only daughter of Mr. Mark Hopkins, of Pau, France, who with a daughter and a son—the latter born since his father's death—survives him.

Capt. LANCE ST. M. PAGE, Yeomanry, attached R.A.F., who was killed while flying on active service on August 20th, 1918, was the only surviving child of the late C. W. H. Page, of Grafton, Ontario, Canada, and of Mrs. Mary Page, 3, East Street, Chelsea, London, aged 28 years.

Capt. S. R. PENROSE-WELSTED, D.F.C., Croix de Guerre (Royal Irish Regiment), Flight Commander R.A.F., reported missing on July 17th, now reported killed in action on that date, aged 29, was the elder son of Mr. S. Q. Penrose-Welsted, of Ballywalter, Castletownrock, Co. Cork. He was educated at Rossall and Sandhurst, and was gazetted to the Royal Irish Regiment in 1909, and on the outbreak of war he was attached to the 5th battalion of that regiment, and went with them to Gallipoli in 1915, and there he was severely wounded. On recovery, he rejoined his regiment on another front. He transferred to the R.F.C. in 1916, and met his death leading his flight in action over the enemy's lines.

Lieut. INDRA LAL ROY, R.A.F., who was reported missing after an action on July 22nd and is now known to have been killed, was the second son of Mr. P. L. Roy, Director of Public Prosecutions, Calcutta, and of Mrs. Roy, of 67, FitzGeorge Avenue, W. He was one of a band of young Indians studying here who, precluded until recently from any chance of obtaining commissions in the Army, found scope for striking a blow for the Empire in the new arm of our forces. His elder brother had enlisted in the H.A.C. as a private within a few weeks of the outbreak of war, and as soon as he himself reached military age, in April, 1917, he left St. Paul's School, and within a few months qualified for a commission in the Flying Corps. He went to the front last October, and did fine work until March, when his machine was brought down, but he was rescued from capture in an injured and unconscious state. In May the doctors permitted his return to do work as equipment officer, but within a few weeks he was medically passed for flying.

Lieut. HENRY WILLIAM SAVAGE, R.A.F., who was killed with his observer, Lieut. Hall, at the front on August 14th was the third son of ex-Inspector Savage, Kent County Constabulary, of Tonbridge. It appears that his machine came in contact with a balloon cable, and was completely wrecked. In 1910 he joined the West Kent Yeomanry, was called up at the outbreak of war, and quickly gained the rank of sergeant. He went with his regiment to Gallipoli, and landed at Cape Helles. Later he was in Egypt and took part in the fighting in Palestine. He had several times been offered a commission, and he eventually accepted, and, taking up flying, obtained his wings at Cairo. He afterwards returned to England, and underwent further training, proceeding again to the front last March, when he was promoted lieutenant. Four brothers of his are also serving.

Capt. VICTOR JOHN WHITAKER, R.F.C., reported missing on April 6th, 1917, and now officially presumed to have died on or about that date, was the second son of Dr. J. Smith Whitaker, of the National Health Insurance Commission, and Mrs. E. L. Whitaker, and was born at Great Yarmouth on June 22nd, 1897. With his elder brother Owen (second lieutenant, R.G.A., M.C., killed on August 29th, 1915), he was educated at University College School, where he was a member of the Officers' Training Corps. In October, 1915, he received his commission as second lieutenant in the Lincolnshire regiment, was subsequently transferred to the R.F.C., obtained his wings in May, 1916, and proceeded at once to the front, where he served continuously, except for two short periods of leave, till his death. Having proved himself

a dexterous and fearless, though careful, pilot, he was promoted (temporary) captain and flight commander in February, 1917, being still only 19. He was brought down on Good Friday, while engaged on a difficult reconnaissance of enemy positions.

Sec. Lieut. GERALD W. F. CLARKE, who was killed in a flying accident near London on August 23rd, was the third son of Sir Frederick W. A. and Lady Clarke, of Sutherland House, Cheniston Gardens, Kensington, and was born on October 9th, 1899. He was educated at Quernmore School, Bromley, Kent, and at Dulwich College, where he was sergeant in the O.T.C. and won the Master's Cup for 1918 awarded to the best platoon commander. In 1917 he won the Anstey Memorial Reading Prize and one of the prizes for the best piece of original work—a pianoforte solo, which he played at the school concert. On March 10th he joined the R.A.F., and received his wings as a pilot just two weeks ago. His eldest brother, Capt. Eric Fitzgerald Clarke, London Regt., was killed at the battle of Arras in April, 1917.

Lieut. ROY LYTTON CUMMINGS, A.F.C., who was accidentally killed on active service, aged 22, was the second son of Dr. H. L. Cummings, of Tasmania, and grandson of the late W. H. Cummings, Mus. Doc.

Lieut. DERMOT O'NEIL DRISCOLL, Middlesex Regiment, attached R.A.F., aged 25, who was killed in an aeroplane accident, was the son of Mrs. I. M. Driscoll, of Old Deer Park Gardens, and of Colonel Driscoll, of Driscoll's Scouts in the South African War, founder of the Legion of Frontiersmen and the commander of the Frontiersmen Battalion of the Royal Fusiliers in East Africa in the present War.

Lieut. S. R. ELWORTHY (DICK), R.A.F., who died on September 1st from injuries received whilst flying on active service in England, was the second son of Mrs. Elworthy and the late F. F. Elworthy, of Grove Hill, Hemel Hempstead.

Sec. Lieut. J. G. HOJEL, R.A.F., who was accidentally killed whilst flying abroad on August 21st, was the eldest son of Mr. A. C. Hojel, of Mexico City, and Mrs. Hojel, Bognor, aged 18 years and 11 months.

Capt. OSWALD HORSLEY, M.C. (and bar), Gordon-Highlanders, younger son of the late Sir Victor Horsley, F.R.S., and of Lady Horsley, of 10, York House, W., was born on February 14th, 1893, and educated at Bedale's School, Petersfield, and at Christ Church, Oxford, where he rowed in the Trials in 1913. He joined the Artists' Rifles on August 3rd, 1914, and was given a commission in the Gordon Highlanders while at the front in November of that year, and while serving with them was thrice wounded, the last time so severely as to incapacitate him for further infantry duty. In August, 1917, he joined the R.F.C., and in four months he had gained his wings and was attached to a scout squadron at the front. He was promoted flight commander last March, and in July was placed on the home establishment, where he was killed with his observer owing to a failure of his machine on August 19th. He was mentioned in despatches, was awarded the M.C. for his gallantry and leadership, and a bar for his work in the R.A.F.

Lieut. ROBERT EDWARD MACBETH, B.A.Sc., R.A.F., who was accidentally killed on August 19th, was the third son of William John and Susanna Colquhoun MacBeth, of Parkdale, Toronto, Canada.

Lieut. A. B. B. PALMER ("JAMMIE"), R.A.F., who died on August 23rd as the result of an aeroplane accident, aged 27, was the son of Mr. and Mrs. A. L. H. Palmer, of 62, Twyford Avenue, Acton, W. 3.

Lieut. WILFRID HAY RUXTON, R.A.F., who died on August 29th as the result of an accident when flying, aged 28, was the youngest son of the late Rev. F. D. Ruxton Well, Yorks, and Mrs. Ruxton, Westfield House, Richmond, Yorks.

Lieut. JOHN SCRACE, R.A.F., who was killed accidentally while flying over Yorkshire, was the only son of Mr. and Mrs. John Scrace, of Beacon Lodge, Chatham, and was aged 26. He was educated at Luton, King's School, Rochester—in his last term there he gained eight prizes at the school sports, besides holding two challenge cups—and Cambridge, gaining an open scholarship at Peterhouse. While at Cambridge he was chosen for a seat in one of the trial eights, but was unable to row owing to illness. In August, 1915, he took up a commission in the Buffs, and at one time held the position of brigade bombing officer and other appointments as instructor; and when he transferred to the R.A.F. he was retained in this country again as instructor.

Lieut. HUGH TERRES, who was killed in flight on August 17th, aged 21, was the son of Dr. J. B. Terres. He was educated at Westminster School and Christ Church, Oxford.

Married.

Flight-Commander JOHN A. BORET, M.C., A.F.C., R.A.F., third son of Mr. and Mrs. Boret, of Chiswick, was married quietly on August 22nd, to CHRISTINE VICTORIA, daughter of Mr. and Mrs. NEWTON, of Bedford Park.

Lieut. EDWARD SANDELL HARVEY, R.A.F., son of Mr. and Mrs. E. D. Harvey, of The Mount, 114, Finchley Road, Hampstead, was married on August 28th at All Souls', Langham Place, to DAISY HILDA, youngest daughter of Mr. and Mrs. CHARLES COOK, of the Limes, Sutton, Surrey.

Capt. J. E. A. HOARE, D.S.C., R.A.F., only son of Mr. and Mrs. Alfred Hoare, of Charlwood, East Grinstead, was married to MARJORIE, fourth daughter of Mr. and Mrs. S. P. TROUNCE, of Culroy, Truro, at Truro Cathedral on September 5th.

Lieut. F. LINDEN HOPPS, K.O.V.L.I. and R.A.F., was married on August 31st at St. Saviour's, Alexandra Park, to CECILE, elder daughter of Mr. and Mrs. A. COHEN, of "Beams-moor," Alexandra Park.

Lieut. LEWIS HUGH MACKAY, R.A.F., only son of Mr. and Mrs. Lewis Mackay, of Whitcroft, Beckenham, was married on August 27th, by special licence at the Chapel Royal, Savoy, to MADGE, only daughter of the late GEORGE HODGKINSON and Mrs. HODGKINSON, of Ben Rhydding, Yorks.

Lieut. RAWDON S. PAYNE, R.A.F., was married on August 29th, at St. Paul's, Knightsbridge, to Miss SYLVIA HARVEY.

Lieut. RICHARD C. PETTER, R.N.A.S., was married on August 13th, at the English Church, The Hague, Holland, to FLORENCE MAY DOUGLAS. Present address: 3, Stadhouderlaan, The Hague.

Mr. HAROLD RAPIER, R.A.F., of Winnipeg, Canada, was married on August 28th to Mrs. J. BELLAMY (HILDA BELLAMY).

Capt. REGINALD STANMORE, R.A.F., son of Inspector of Machinery H. C. Stanmore, R.N. (retired), was married very quietly on August 20th, at St. Mark's Church, Salisbury, to DOROTHY FLORENCE, daughter of Mrs. E. F. WILKINS, late of "Riverside," Ware.

To be Married.

An engagement is announced between Maj. ERIC B. BEAUMAN, R.A.F., younger son of Mr. and Mrs. Bentley Beauman, Seafeld, Seaview, I.W., and IRIS MURIEL USHER, elder daughter of the late St. CLAIR CUNNINGHAM and Mrs. St. Clair Cunningham, Hedderwick Hill, Dunbar.

The engagement is announced of Maj. W. BOYS-ADAMS, R.A.F., third son of Mr. and Mrs. Lemesle Adams, Pendeford Hall, Wolverhampton, and grandson of the late Admiral Henry Boys, to ENID, second daughter of Mr. and Mrs. CARNEGIE ARBUTHNOTT, of Balnamoon, Brechin, Forfarshire, and 34, Roland Gardens.

An engagement is announced between Capt. JOHN CHARLES BRADLEY FIRTH, M.C., R.A.F., younger son of John Bradley Firth and Mrs. Firth, Bishop's Sutton House, Alresford, Hants, and RUTH ELEANOR, younger daughter of the Rev. J. H. HODGSON, Dogmersfield Rectory, Winchester, Hants.

A marriage has been arranged between Maj. ARTHUR W. FARRER, R.A.F., second son of Mr. John Farrer, of Ivydene, Crescent Road, Crouch End, and ETHEL FLORENCE, eldest daughter of Mr. and Mrs. CARLTON ROBERTS, of Temple Grove, Golders Green, late of Wanstead, Essex, and will take place quietly on September 11th, at 12, at St. Peter's-upon-Cornhill.

A marriage has been arranged, and will shortly take place in Cairo, between Brevet Lieut.-Col. R. E. M. RUSSELL, D.S.O., Royal Engineers, attached R.A.F., second son of Mr. and Mrs. E. M. Russell, of Milford House, Limerick, Ireland, and DOROTHY BARRINGTON, twin daughter of the late Major E. B. CRAKE, Rifle Brigade.

Items.

CAPT. C. W. F. MORGAN, R.A.F., has been appointed assistant political organiser by the Executive Committee of the British Commonwealth Union. Capt. Morgan, Chairman of the Surrey Division of the Comrades of the Great War, is the son of Capt. C. H. Morgan, R.N.

The will of Lieut. KENNETH CHESTER HERRON, Yeomanry, attd. R.A.F., aged 37, of Wickham Place, Wickham Bishops, Essex, and of Messrs. G. R. Herron and Sons, Ltd., leather merchants, St. Thomas's Street, S.E., who was killed in action on April 24th, has been proved at £75,574.

The will of Capt. CHRISTOPHER FRANCIS ADEN LEY, R.F.C. and Yeomanry, aged 24, of Lealholm Lodge, Glaisdale, Yorks, who served in Gallipoli and died as the result of a flying accident, son of the late Sir Francis Ley, Bt., was proved at £14,869.

THE ROYAL AIR FORCE

London Gazette, August 27th.

The following temporary appointment is made:—
Staff Officer, 3rd Class.—Lieut. (Temp. Capt.) H. M. Ferreira, and to retain his temp. rank whilst so employed; June 10th.
 The name of Capt. T. C. Macaulay, M.C., is as now described, and not as stated in *Gazette* May 10th.

Flying Branch.

Capt. M. Le Blanc-Smith, D.F.C., to be Temp. Maj. whilst employed as Maj. (A.); Aug. 9th.

Lieuts. (Temp. Capts.) to be Temp. Majs. whilst employed as Majs. (A.):—
 E. P. Scott; June 19th. J. S. Williams, M.C.; Aug. 2nd.

Lieut. (Temp. Capt.) J. P. Coleman to be Temp. Maj. whilst employed as Maj. (A. and S.); Aug. 8th.

Lieut. (Temp. Capt.) T. W. Elmhurst to be Temp. Maj. whilst employed as Maj. (Dir.); April 6th.

Lieut. (Temp. Capt.) B. D. Hobbs, D.S.O., D.S.C., to be Temp. Maj. whilst employed as Maj. (S.); May 31st.

Lieuts. to be Temp. Capts. whilst employed as Capts. (A.):—R. W. Rose; April 22nd. A. B. Dees; July 6th. G. N. Anderson; July 27th. J. R. Bell; July 29th. F. B. Barager, G. Bremridge, J. Bussey, F. F. Babbage, H. B. Burrell, D. F. Collins, I. M. Davies, A. H. G. Dunkerley, D. Dalgleish, F. M. Green, H. R. Griffin, (Hon. Capt.) F. M. Hicks, J. L. S. Hanman, W. Jones, J. G. Kidd, W. F. Mayoss, E. H. Marsden, C. E. Maslin, P. Movency, H. F. Nicholls, W. E. Nicholson, J. J. Paine, J. W. Rayner, R. H. Stocken, W. D. B. Taylor, (Hon. Capt.) W. R. Winterbottom, C. A. B. Wilcock, H. W. Wheatley; Aug. 1st. C. Thomas; Aug. 3rd. E. J. Addis; Aug. 8th. S. Carlin, M.C., D.C.M., E. J. Salter, F. Smethurst; Aug. 9th. C. V. Gardner; Aug. 12th. H. Ford; Aug. 13th. A. R. McAfee; Aug. 14th. F. W. Clark, G. Gillanders; Aug. 15th. (Hon. Capt.) H. E. Winter; Aug. 16th. G. W. F. Darvill, H. W. Hewson, E. L. Zink; Aug. 18th. C. E. Abell, J. D. Breakey, J. D. McCall, A. D. K. Perkins, J. B. White; Aug. 19th.

Lieut. (Hon. Capt.) C. M. Briscoe-Owen to be Temp. Capt. whilst employed as Capt. (O.); May 31st.

Lieut. (Hon. Capt.) N. H. Woodhead to be Temp. Capt. whilst employed as Capt. (S.); June 15th.

Lieut. (Temp. Capt.) L. R. Charron relinquishes his temp. rank on reversion to Lieut. (A.); Aug. 14th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A. and S.):—A. J. Hamilton; May 14th. R. C. Tice; May 15th. J. B. Elton; June 8th. E. McEvoy; June 9th. C. A. Harrison; June 12th. K. R. March; June 20th.

The following Prob. Flight Officers (late R.N.A.S.) are granted temp. comms. as Sec. Lieuts. (A. and S.):—S. Castle-Smith; April 17th. D. B. Foss, R. H. Foss; April 25th. S. J. Bolitho, J. R. Taylor; May 15th. P. B. Calder; May 22nd. A. W. Beaven; May 24th. R. E. Thompson; June 9th. R. K. Stinson; June 11th. D. F. Tysoe; June 16th. P. R. J. Roberts; June 20th. H. L. Pitt, P. H. Goodhugh; June 21st. A. H. Partridge, P. E. Clarke; June 22nd. J. R. Robertson; June 24th. G. Kidd, G. W. Cooper; June 26th.

The following are granted temp. comms. as Sec. Lieuts. (A. and S.):—A. M. Campbell (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; April 20th. S. H. Richardson; June 18th.

The following Cadets are granted temp. comms. as Sec. Lieuts. (A. and S.):—A. D. Butler, G. C. Blythe, T. Gray, B. J. Hendry, E. Hughes, I. G. Morrison, C. G. Henderson, B. C. Gibaud; July 30th.

The following Flight Cadets are granted temp. comms. as Sec. Lieuts. (A. and S.):—F. R. Brown; July 20th. G. C. Robbins, C. L. Hurst; July 22nd. R. D. Gilpin-Brown, G. A. Millbank, F. J. Keble, J. S. King, A. R. Robb, G. W. Jones; July 29th. A. Barnes, H. W. Gill; July 30th. C. M. Allan, P. W. Scott, W. F. Smith, G. J. Dickens, C. Turner, N. Smith, R. S. Kenyon; July 31st. F. W. Moulson; Aug. 1st. B. F. J. Johnson, B. T. Humphreys, A. E. Cuthbert; Aug. 2nd. D. D. Ashley; Aug. 5th. E. C. Brown; Aug. 8th. G. L. Reid, C. M. Galletty, F. C. Andrews, M. C. Kerr, W. L. Widgery; Aug. 9th. A. R. Deans, L. C. Welch, E. H. Bird; Aug. 10th. H. D. Thornton; Aug. 11th. J. M. Kelly; Aug. 12th. T. Burton, J. E. Whitehead; Aug. 13th. A. H. Griffiths, S. E. Storey, J. Browning, N. V. Moreton, E. A. Harrison; Aug. 14th. E. F. Wilkinson; Aug. 16th.

H. B. K. Trollope (late Lieut., S.A. Forces) is granted a temp. commn. as Sec. Lieut. (Dir.), and to be Hon. Lieut.; Aug. 1st.

Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (K.B.):—A. C. Whittle, J. S. Wilson, E. G. Walker, W. F. Conway, J. H. Ashton, G. C. R. List, S. K. Barnes, A. B. G. Gunn, E. Dear, T. Hall, J. A. Hinchliffe, W. Barrett; May 16th. H. Shoosmith; July 16th.

The following are granted temp. comms. as Sec. Lieuts. (K.B.):—W. C. Harvey (Sec. Lieut., Arg. and Suth'd. Hghrs., T.F.); July 1st. W. Barlow (Sec. Lieut., L'pool. R., T.F.); July 10th. J. L. Booth (Maj., R.E., T.F.), and to be Hon. Maj.; July 30th. C. R. Smallwood (Sec. Lieut., L'pool. R., T.F.); Aug. 4th. H. Hough (Sec. Lieut., N. Staff. R., T.F.); Aug. 7th.

Sec. Lieut. A. Barnes to be Sec. Lieut. (K.B.) from (T.); July 23rd.

The following prob. Flt. Offs. (late R.N.A.S.) are granted temp. comms. as Sec. Lieuts. (K.B.):—H. M. Whittle, H. J. Graves; May 11th. W. R. Atkinson, H. D. Johnson, A. H. Walton, W. J. Guppy, E. C. Parkinson, H. W. Symes, J. E. Wilkinson; May 16th. A. H. Wooster; May 17th. T. C. Lennox, H. P. Woodman, C. E. Jones, P. N. Kerney, E. H. H. Peel, A. Paveley, R. A. Mills, E. I. Davis, R. A. Talley, L. N. Mudditt; July 1st. W. J. Stratford, S. V. Annis; July 16th. A. E. Haylett; Aug. 7th.

The following Flight Cadets are granted temp. comms. as Sec. Lieuts. (Ob. Offrs.):—H. Buckner, P. A. Clayton; May 18th. J. C. Baxter, A. A. Tutte, J. Wood; July 26th. I. S. Woodhouse; Aug. 10th. B. E. J. D. Tukey, J. Lettwith, W. T. S. Lewis, H. G. Lewis, A. McL. Miller, S. M. Myles, L. P. Perry, C. R. Pickering, S. C. Read, J. Ritchie, C. H. Senegal, E. T. Shone, W. M. Thompson; Aug. 16th. E. G. R. V. Bramble; Aug. 22nd. R. H. Armstrong, S. A. Barnett, W. Bailey, L. C. Belcher, W. V. Philpott, H. J. Pretty, C. E. Robinson, H. H. Senior, H. W. Williams, H. P. Hobbs, J. Davison, H. S. Chapman, A. G. Squire, A. E. Stock, C. O. Thompson, W. L. Walker, A. I. Watts, C. Wilkinson, H. C. Allen, G. S. Barber, R. Dunn, F. N. Coxhill, W. C. Bradenell, S. Burbridge, H. R. Burnett, R. F. Crossling, J. D. Evans, E. D. Barnes, C. E. Bellord, T. Calvert, J. C. Castle, R. Davison, G. A. Large, F. W. Ford; Aug. 23rd. D. E. Coe, S. F. Bett, S. F. Blackwell, F. Baylis, A. P. Booth, O. Berridge, P. F. Bruce, F. A. Bradley, J. B. Ballantyne, R. B. Gordon, R. C. Holdom, A. Johnson, A. S. H. Mills, A. Mulholland, P. V. Dobby, R. C. Cornell, H. N. Callaway, H. C. Norman, F. Nottingham, F. J. Shrive, E. V. Smith, B. Shaw, L. F. R. Ollington, J. R. Wilkinson, W. F. Watson, A. H. Winham, G. D. Lane, D. Neale, A. Taylor; Aug. 24th. W. H. Greaves, W. C. Benton; Aug. 25th. W. B. Clarke, H. S. Cranfield, R. H. Dilloway, A. Gammon, G. W. Pearce, T. L. Rose, A. Tretheway, H. Wittup, J. H. Kennedy; Aug. 26th.

The following relinquish their comms. on ceasing to be employed:—Sec. Lieut. C. P. Todd; July 10th. Lieut. C. P. Sheppard; Aug. 1st.

Lieut. F. W. Chambers relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut.; Aug. 28th.

The following Sec. Lieuts. relinquish their comms., having been found permanently unfit for further instruction as Pilots or Observers:—W. E. Hunt, C. P. Rumball, J. D. Taylor; Aug. 28th.

The date of relinquishment of commn. by Sec. Lieut. F. Steel is July 26th, and not as stated in *Gazette* July 12th.

The surname of Lieut. J. F. Forster, Bord. R., T.F. (Sec. Lieut., A. and S.), is as now described, and not as in *Gazette* July 19th.

The surname of Charles Evans Thorpe is as now described, and not Thorpe, as in *Gazette* Aug. 9th.

The initials of Sec. Lieut. L. J. W. Murphy are as now described, and not as in *Gazette*, July 12th.

The notification in *Gazette* Aug. 6th, concerning H. B. King, is cancelled.

Administrative Branch.

Cpts. to be Temp. Majs. while employed as Majs.:—S. H. Cleall; July 9th. A. M. Lester; July 23rd.

Lieuts. (Temp. Capts.) to be Temp. Majs. while employed as Majs.:—R. A. Hassard; July 23rd. M. Skitt; Aug. 1st. J. C. Forsyth; Aug. 19th.

Lieuts. to be Temp. Capts. whilst employed as Capts.:—W. C. Hacon, C. W. Jamieson, W. G. Nutter; May 15th.

Lieuts. to be Lieuts., from (A.):—(Temp. Capt.) J. S. Michie, M.C., and to be Hon. Capt.; June 6th. E. R. Evans; July 23rd. (Hon. Capt.) A. B. Campbell, and to be Hon. Capt.; Aug. 1st. B. H. Godfrey; Aug. 10th. J. W. Jackson; Aug. 16th.

Lieut. C. Clarke to be Lieut., from (K.B.); Aug. 20th.

Lieuts. to be Lieuts., from (O.):—H. S. Cudlip; June 10th. V. J. Holland; June 30th.

Lieut. (Hon. Capt.) J. C. Watson to be Lieut., from (S.), and to be Hon. Capt.; Aug. 6th.

W. H. D. Phillips (Temp. Qrmr. and Hon. Lieut., R. Mar.) is granted a temp. commn. as Lieut.; June 26th (substituted for notification in the *Gazette* of July 30th).

C. H. Markham (Capt., North'd. Fus.) is granted a temp. commn. as Lieut., and to be Hon. Capt.; Aug. 15th.

Sec. Lieuts. to be Temp. Lieuts. whilst employed as Lieuts.:—W. A. Carroll, R. C. Clements, F. Freeman, A. E. Marriott, A. H. Read, G. F. Tidbury, G. Williams; May 15th. G. J. Mackie, D.C.M.; July 26th. H. P. Souter; Aug. 18th.

The following are granted temp. comms., as Sec. Lieuts., and to be Temp. Lieuts. whilst specially employed:—C. A. Assiter, L. H. Bainton; Aug. 26th.

The following are granted temp. comms. as Sec. Lieuts.:—S. J. Croad; Aug. 13th. W. Chester, D. T. Davies, T. J. Harrington (Qrmr. and Hon. Lieut. Lond. R.), and to be Hon. Lieut., H. A. Pippett, F. W. Waller; Aug. 24th. R. H. Clarke, H. D. Diggle, C. Green, A. A. Loveridge, A. H. Searle (late Lieut. S.A. Rif.), and to be Hon. Lieut., K. M. Vaughan; Aug. 26th.

Sec. Lieut. P. H. Hutchings resigns his commn.; Aug. 28th.

The initials of Lieut. L. A. Woodward are as now described, and not as in *Gazette*, Aug. 16th.

Technical Branch.

Cpts. to be Temp. Majs. while employed as Majs.:—T. Macleod; June 19th. S. A. Currin; July 23rd.

Lieuts. (Temp. Capts.) to be Temp. Majs. while employed as Majors:—J. H. B. Burgess, W. S. Hammond; July 9th. R. E. Cook; July 23rd.

Lieuts. to be Temp. Capts. while employed as Capts.:—A. W. Phillips, M.C.; April 1st. F. G. Brockman; May 1st. H. G. Etheridge, F. B. Nichol; May 15th. W. J. R. Sheppard; May 31st. W. G. Barry, G. L. Chater; June 1st. H. J. Finer, from (A.); July 23rd. (Hon. Capt.) E. S. Cohen; July 24th. H. J. L. Cappel, from (O.); Aug. 5th. Lieut. A. Firth to be Lieut., from (A.); June 1st.

Lieuts. to be Lieuts. from (O.):—W. Hinsley; June 28th. W. McC. Taylor; July 1st.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts.:—(Hon. Lieut.) J. B. Roth; April 1st. (Hon. Capt.) T. R. Duff, and retains his hon. rank; P. Haselock, E. W. M. Tomlinson; May 1st. J. Booth, H. H. Cox, F. B. Woods; May 15th. W. R. Munro; June 1st. F. Atkins; June 14th. (Hon. Lieut.) J. B. Bown, (Hon. Capt.) U. Brown, and retains his hon. rank, C. Hammersley, C. G. Whitmore; July 1st. (Hon. Lieut.) D. G. Bown Aug. 4th. J. Darwen, F. P. Williams; Aug. 18th.

D. Simmons is granted a temp. commn. as Sec. Lieuts.; Aug. 26th.

Lieut. R. H. Whittington resigns his commn.; Aug. 28th.

The initials of Lieut. (Hon. Capt.) F. B. Bedford are as now described, and not as in *Gazette* July 2nd.

Medical Branch.

P. T. J. O'Farrell is granted a temp. commn. as Capt.; Aug. 26th.

The following are granted temp. comms. as Lieuts.:—J. G. Bird; Aug. 23rd. J. Ferguson; Aug. 26th.

The date of appointment of N. Homewood as Temp. Lieut. is Aug. 12th, and not as stated in *Gazette* Aug. 16th.

Dental Branch.

S. C. Turner is granted a temp. commn. as Lieut.; Aug. 26th.

Memoranda.—Capt. H. A. Porter relinquishes his appointment as S.O.; April 15th.

Lieut. (Hon. Capt.) D. C. Woods to take rank and prec. as if his appointment as Lieut. bore date Jan. 1st.

London Gazette, August 30th.

The following temporary appointments are made at the Air Ministry:—
Deputy Chief of the Air Staff.—Col. (Temp. Brig.-Gen.) O. Swann, and to retain the temp. rank of Brig.-Gen. while so employed, vice Lieut.-Col. (Temp. Brig.-Gen.) R. M. Groves, D.S.O.; Aug. 12th.

Staff Officer, 2nd Class.—Air.—G. J. Watney (actg. Staff Paym., R.N.), and is granted a temp. commn. as Maj.; July 15th.

Staff Officer, 3rd Class.—A. J. Dawson (Temp. Capt. in Army), and is granted a temp. commn. as Capt.; April 22nd.

The following temporary appointments are made:—
Staff Officer, 1st Class.—Maj. R. B. B. Colmore, and to be Temp. Lieut.-Col. while so employed; May 14th.

Staff Officers, 3rd Class.—P.—Lieut. G. E. Moore, and to be Temp. Capt. while so employed; April 1st.

The name of Capt. C. C. Treatt is as now described, and not as in *Gazette* May 10th.

Flying Branch.

Capt. (Temp. Maj.) W. G. Sitwell to be Temp. Lieut.-Col. while employed as Lieut.-Col. (A. and S.); Aug. 8th.

To be Temp. Lieut.-Cols. while employed as Lieut.-Cols. (S.):—Maj. E. R. C. Nanson, D.S.C., Capt. (Temp. Maj.) E. V. S. Wilberforce; Aug. 8th.

To be Temp. Majs. while employed as Majs. (A.):—Lieut. (Temp. Capt.) W. A. Hannay; May 31st. Capt. C. M. Leman, M.C.; Aug. 14th. Lieut. (Temp. Capt.) T. Q. Back; Aug. 15th.

Lieuts. (Temp. Capts.) to be Temp. Maj. while employed as Maj. (A. and S.):—A. N. Gallehawk, F. J. Linnell; Aug. 1st.

Capt. A. T. Moore to be Temp. Maj. while employed as Maj. (K.B.); May 27th.

Capt. C. MacLaurin, D.S.C., to be Temp. Maj. while employed as Maj. (S.); Aug. 19th.

Lieuts. to be Temp. Capts. while employed as Capt. (A.):—P. T. Carden, M.C.; May 27th. A. D. Broughton; June 1st. M. L. Cooper; July 3rd. O. M. Baldwin; July 22nd. (Hon. Capt.) T. P. M. Alexander, E. E. Macartney; Aug. 1st. (Hon. Capt.) H. S. Holman; (Hon. Capt.) C. B. Sproatt; Aug. 8th. S. C. Joseph; Aug. 10th. H. Hillier; Aug. 11th. K. C. Tilman; Aug. 12th. T. C. Luke, M.C.; Aug. 13th. N. R. Smuts; Aug. 14th. L. G. Banks; Aug. 15th. W. G. Gairdner; Aug. 17th. C. P. Brown, E. C. Hoy, H. C. Senior, W. E. Shields; Aug. 19th. J. E. Croden, W. D. Knibbs, G. O. Newton; Aug. 23rd. G. E. Race; Aug. 24th.

Lieut. (Hon. Capt.) C. Bumphrey to be Temp. Capt. whilst employed as Capt. (A. and S.); Aug. 1st.

Lieuts. (Hon. Capts.) to be Temp. Capts. whilst employed as Capt. (K.B.):—E. E. Barnett, K. B. S. Greig, F. B. Towers; April 24th. D. B. M. Hume; April 25th. J. R. Blunt; May 7th. O. M. Ayrton, O. S. Stiles; May 27th.

Lieut. F. Tymms, M.C., to be Temp. Capt. whilst employed as Capt. (O.); May 31st.

Lieuts. (Hon. Capts.) to be Temp. Capts. whilst employed as Capt. (S.):—B. A. Smart, D.S.O.; Aug. 1st. A. T. Barker, C. W. Bailey, R. D. Delamere, M. Faux, G. D. Kirkpatrick, H. Rampling; Aug. 8th.

Lieuts. to be Temp. Capts. whilst employed as Capt. (S.):—T. H. Boyd, H. L. Macro; Aug. 1st.

Capt. D. C. Ware reverts to Lieut. (A.) at his own request; Aug. 7th.

Lieut. (Temp. Capt.) I. H. P. McEwen relinquishes his temp. rank on ceasing to be specially employed; Aug. 12th.

Capt. F. A. M. Rawes to be Lieut. (Dir.) from (Ad.) and to be Hon. Capt.; Aug. 1st.

Lieut. F. W. Thomas to be Lieut. (O.) from (T.), and to retain his original seniority; July 15th.

Sec. Lieut. F. W. Elliott (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut. (A. and S.); July 19th.

K. B. Wilkinson (Prob. Flight Officer, late R.N.A.S.) is granted a temp. commn. as Sec. Lieut. (A. and S.); May 6th.

The following are granted temp. commns. as Sec. Lieuts. (A. and S.):—J. E. S. Jones (Lieut., North'n R., T.F.), and to be Hon. Lieut.; May 19th. J. E. Lowdon; June 20th. A. A. B. Chipper; July 2nd. H. D. McGrath (Lieut., Brit. Columbia R., C.E.F.), and to be Hon. Lieut.; July 19th. H. W. Bush; Aug. 17th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.):—V. W. Lindars; June 16th. G. B. Harper, A. E. Loveday; June 17th. L. J. Betts; June 18th. W. G. Searight, J. A. Arnott, G. V. Yorke, G. G. H. Du Boulay; June 19th. R. J. Winbolt, E. H. Dodds, T. C. Ormrod, S. L. McKillen; June 20th. W. Druce, S. J. Appleby; June 21st. J. S. Renton, W. E. Everett; June 22nd. F. W. Skelton, W. Cooper, G. R. Allport, A. B. Crawford; June 24th. H. Murray, A. H. Sower; June 26th. G. B. H. Baker, H. F. Carpenter, R. V. O'Connor, J. Edmunds; June 27th. E. T. Brant, A. R. L. Lango, S. C. S. Manning, A. A. McHardy, J. F. Greenwood, A. W. Amies, H. K. Wilson, H. W. Wallace, A. S. Woodthorpe, F. W. Hart; June 28th. A. R. Loveridge, V. F. Rogers, J. Burr, G. S. Eby, L. J. Cuzner, C. S. Fowler; June 29th. W. H. Hutt, H. T. Ebbutt; June 30th. E. B. Thomson; July 7th. C. H. Roy; July 9th. T. G. Simpson; July 12th. W. R. Moscrop; July 26th. R. Barker, H. E. Wase; July 27th. S. H. Wheatley; July 28th. G. W. MacLeish; July 30th. L. W. Marchant, W. H. Scribbins, C. R. McInnes, T. F. Naylor; July 31st. O. L. Canton, J. O. R. S. Saunders, J. H. Parkinson; Aug. 9th. W. O. G. Fenton; Aug. 10th. E. C. W. Thresher, N. Floyd; Aug. 12th. T. A. Jackson, P. B. Townsend; Aug. 13th. R. E. La F. Wyatt, L. Reader; Aug. 14th. I. M. Marris; Aug. 15th. E. A. Smith, J. E. Way, C. A. Beattie, T. V. Callard, F. G. Tomlie; Aug. 16th. F. Smith, C. Johnson; Aug. 17th. G. M. J. Morton; Aug. 15th. J. E. Harrison; Aug. 18th.

F. Jones (Temp. Sec. Lieut., Bord. R.) is granted a temp. commn. as Sec. Lieut. (K.B.); Aug. 7th.

The following are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—F. D. Genlcloud (Temp. Sec. Lieut., S. Wales Bord.), P. C. Samuel (Lieut., attd. R. War. R.), and to be Hon. Lieut., P. Bolland (Sec. Lieut., L'pool R., T.F.); Aug. 29th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—G. T. Carr; May 25th. W. G. West, A. R. Green, H. C. Shearman, E. Priest, S. C. Hewitt, G. S. Cogan; June 22nd. L. T. Harris, A. A. Cowan, H. Gerhardt, J. M. James, C. E. Standish, C. J. Baldock; July 2nd. W. W. Pritchard, C. E. Mason, D. E. Dann, S. Dennis, R. Clarkson, E. W. Hargreaves; Aug. 29th.

The following Lieutenants relinquish their commissions on account of ill-health, and are granted the hon. rank of Lieut.:—C. W. Rivers, H. G. H. Stewart; Aug. 31st.

Lieut. H. Seymour relinquishes his commission on ceasing to be employed; Aug. 21st.

The date of appointment of Flight Cadet J. M. Scott as Sec. Lieut. (Obs. Officer) is Aug. 25th, and not as stated in *Gazette* July 23rd.

The date of appointment of Flight Cadet S. G. Burton (since killed) as Sec. Lieut. (Obs. Officer) is July 18th, and not as stated in *Gazette* July 30th.

The date of the relinquishment of commn. by Sec. Lieut. C. H. Ryley is Aug. 31st, and not as stated in *Gazette* July 30th.

The surnames of the following Flight Cadets are as now described and not as in *Gazette* Aug. 13th:—R. M. Fulton, T. J. Calnan.

The Christian name of Alfred Camp is as now described, and not as in *Gazette* Aug. 13th.

The Christian names of the following Flight Cadets are as now described, and not as in *Gazette* stated against their names:—William Trudgian Richards; Aug. 6th. Philip Carrington Seale McCrea; July 30th.

The surnames of the following Flight Cadets are as now described, and not as in *Gazette* stated against their names:—E. R. Pett; Aug. 6th. A. Whiclow; July 17th.

The name of Richard Henry Foxlee (now Sec. Lieut. Dir.) is as now described, and not as in *Gazette* June 14th.

The surname of Flight Cadet Herbert Thomas Barnett is as now described, and not as in *Gazette* Aug. 20th.

The notification in *Gazette* Aug. 9th concerning Sec. Lieut. L. G. Davies is cancelled.

Administrative Branch.

Lieut. (Temp. Capt.) F. R. Bush to be Temp. Maj. while employed as Maj.; June 28th.

W. H. Wynnsford (Qrmr. and Hon. Capt. (T.F.), Gen. List) is granted a temp. commn. as Capt.; June 22nd.

Capt. F. A. M. Rawes to be Capt., from (S.O.); June 24th.

Lieuts. to be Temp. Capts. while employed as Capt. (A.):—P. E. D. Addis, T. E. Mills; June 10th. G. R. C. Oliver; July 26th.

Sec. Lieut. (Temp. Lieut.) G. B. Redgrave to be Temp. Capt. while employed as Capt.; July 26th.

Sec. Lieuts. (Hon. Lieuts.) to be Temp. Capts. while employed as Capt. (A.):—R. J. R. Farrow, H. McG. Wood; June 6th. A. G. Buxton; June 17th.

Sec. Lieut. J. A. F. Henderson to be Temp. Capt. while employed as Capt.; May 30th.

Lieut. (Temp. Capt.) E. Newling retains his temp. rank while employed as Capt., from (A.); Aug. 21st.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts. (A.):—L. A. Lavender; April 2nd. W. W. Scott-Davidson; April 15th. A. H. Jones; May 27th. H. F. W. Farquharson; May 30th. G. H. Wiggins; May 31st. A. J. Tutton, June 6th.

Lieuts. (O.) to be Lieuts. (A.):—D. F. Hurr, A. F. Tabraham; June 6th. W. J. Matthews; July 22nd. J. S. Russell-Rigby; July 23rd.

Lieut. E. Edwards to be Lieut., from (T.); Aug. 22nd.

Capt. E. Johnson reverts to Lieut. at his own request; Aug. 17th.

The following are granted temp. commns. as Lieuts. (A.):—C. E. Smith (Lieut. N. Staffs. R.); April 17th. J. S. Stooke-Vaughan (Lieut., R.G.A., S.R.); May 28th (substituted for notification in *Gazette* June 11th); L. V. Popkiss (Temp. Capt., Ayr Yeo.), and to be Hon. Capt.; July 9th. H. H. Coffin; Aug. 14th (substituted for notification in *Gazette* Aug. 16th). B. J. Kirchner (Temp. Lieut., S. Staffs. R.); Aug. 13th. P. J. Scott (Lieut., R. Dub. Fus.); Aug. 17th.

J. M. Adams (Sec. Lieut., Gord. Highrs.) is granted a temp. commn. as Sec. Lieut., and to be Temp. Lieut. while employed as Lieut.; June 18th (substituted for notification in *Gazette* July 30th).

A. Crook is granted a temp. commn. as Sec. Lieut., and to be Temp. Lieut. while specially employed; Aug. 26th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A.):—E. C. Chapman; June 30th. W. J. Dayrell Steyning; July 13th.

The following are granted temp. commns. as Sec. Lieuts. (A.):—F. A. Osborn; June 22nd. E. T. Fielding (Lieut., R.E., T.F.) and to be Hon. Lieut.; Aug. 16th. G. Wilson; Aug. 22nd. W. A. Cafford, and to be Hon. Lieut.; T. Covell, B. J. C. Hamm (Hon. Sec. Lieut., Ret. Pay), V. du B. Smythe; Aug. 26th. H. S. Peacock; Aug. 27th.

Capt. G. C. May (Capt., Bord. R.) relinquishes his commn. on ceasing to be employed; Aug. 17th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are granted the hon. rank of Sec. Lieut. (A.):—C. S. Keeling, J. M. Sutcliffe; Aug. 31st.

Sec. Lieut. J. A. York resigns his commission; Aug. 31st.

The date of relinquishment of commn. by Capt. C. Hunt is July 29th, and not as stated in *Gazette*, Aug. 9th.

The notification in *Gazette*, July 2nd, regarding Lieut. (Temp. Capt.) F. Jewell is cancelled.

The notification in *Gazette*, June 7th, regarding Sec. Lieut. (Temp. Lieut. G. E. Smith) is cancelled.

Technical Branch.

Lieut.-Col. B. R. W. Beor to be Lieut.-Col., from (Ad.); June 6th.

Capt. F. G. Wilson to be Temp. Maj. while employed as Maj.; May 31st.

Lieuts. (Temp. Capts.) to be Temp. Maj. while employed as Maj. (A.):—W. T. Hanson, B. W. M. Williams; May 15th. H. R. Mosenthal; July 15th. W. G. Cleghorn; July 23rd.

Lieuts. to be Temp. Capts. while employed as Capt. (A.):—C. King; April 1st. H. L. Connor; May 30th. T. Bell, M.M., S. T. Fripp; May 31st. L. A. Goss; June 1st. A. G. C. Dann; June 6th. T. B. Drowley; June 30th.

Sec. Lieuts. to be Temp. Capts. while employed as Capt. (A.):—F. R. Assinder; May 30th. (Temp. Lieut.) R. G. Meech; June 1st. (Temp. Lieut.) A. F. K. White; June 6th.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts. (A.):—(Hon. Lieut. L. W. Allen, M.C., J. P. White; April 1st. A. H. Edwards, Hon. H. G. H. Mulholland; May 1st. G. A. Spencer; May 15th. A. J. Moore; May 27th. H. S. Alger, R. Bassett, E. W. Dormer, J. W. Gage, C. N. Henderson, A. E. Millson, A. Morison, A. Walters; May 30th. W. Blackwell, A. H. Comfort, (Hon. Lieut.) W. H. Hoile, A. W. McClellan; May 31st. (Hon. Lieut.) E. F. Boulton, (Hon. Lieut.) R. B. Dormor; June 1st. J. O. Furber, (Hon. Capt.) G. R. B. Martin, and to be Hon. Capt., F. R. T. Pearson; June 10th.

Lieuts. to be Lieuts., from (A.):—E. W. Edwards, (Temp. Capt.) F. D. Grant, and relinquishes his temp. rank, V. I. Hardy, B. B. Lemon; June 6th. M. B. Cole, D. Parker; Aug. 18th.

Lieut. A. N. Mercer to be Lieut., from (Ad.); Aug. 12th.

Lieut. C. H. Knight to be Lieut., from (K.B.); June 6th.

Lieuts. to be Lieuts., from (O.):—L. Bateman, C. S. Heaton, R. Hegan, W. G. Hunnissett, B. F. Sandy, J. L. Smith, M.C., D. Taylor; June 6th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A.):—H. W. W. Hatch; May 31st. S. H. Fitter, E. J. Totoonchie; July 20th. C. S. Goode; Aug. 1st. W. C. Burleigh, R. B. Whittick; Aug. 9th.

Sec. Lieuts. (Ad.) to be Sec. Lieuts. (A.):—L. Wardley; June 3rd. E. Redpath; June 24th. A. E. Pitcher; July 3rd. L. L. Bridgman, G. H. Winkworth, S. Wootton, B. W. Wright; July 5th. J. A. Elliott, A. V. Scholes; July 7th. J. Davies; July 20th. W. H. Henstridge; July 25th. E. G. Stott; Aug. 1st. L. Evans; Aug. 3rd. W. H. E. Thomas, C. H. Hare, A. T. Davis, E. Holt; Aug. 6th. F. C. Warren; Aug. 7th.

Lieut. L. E. Lomas to be Sec. Lieut. and to be Hon. Lieut. from (Ad.); Aug. 9th.

Lieuts. (A. and S.) to be Sec. Lieuts., and to be Hon. Lieuts. (A.):—S. G. Robinson; May 31st. E. Marsden; July 13th. P. E. Harris; July 22nd. S. Symonds; Aug. 3rd. L. H. Gamble; Aug. 7th. W. L. Head; Aug. 9th.

Lieuts. (Observer Officers) to be Sec. Lieuts., and to be Hon. Lieuts. (A.):—A. Barr; July 22nd. A. A. Davis, T. P. S. Summerson, B. L. Blomley; July 27th. G. W. G. Tucker; Aug. 3rd. F. H. Keli; Aug. 9th.

The following are granted temp. commns. as Sec. Lieuts. (A.):—T. C. Holleyman (Temp. Lieut., R.W. Fus.), and to be Hon. Lieut., C. C. Newton-Wade (Capt., Yorks. L.I., T.F.), and to be Hon. Capt., C. B. Swanson (Temp. Lieut., attd. K.O. Soc. Bord.), and to be Hon. Lieut.; May 31st. G. F. Antell (Lieut., Can. Ord. Corps, C.E.F.), and to be Hon. Lieut.; June 11th. J. Cawley (Temp. Lieut., Manch. R.), and to be Hon. Lieut.; July 22nd. A. D. H. Foster (Temp. Lieut., E. Kent R.), and to be Hon. Lieut., A. G. Green (Temp. Lieut., A. Cyclist Corps), and to be Hon. Lieut.; Aug. 1st. W. Oddey (Lieut., Essex R., T.F.), and to be Hon. Lieut., E. C. Williams, M.C. (Sec. Lieut., R. Muns. Fus., S.R.), W. S. H. Smith (Capt., Lond. R., T.F.), and to be Hon. Capt.; Aug. 6th. R. G. Michaelson (Lieut., E. Ont. R., C.E.F.), and to be Hon. Lieut., D. Ottewell (Temp. Sec. Lieut., Leic. R.), G. E. Patterson (Lieut., Alberta R., C.E.F.), and to be Hon. Lieut., L. W. Donald (Lieut., Northd. Fus.), and to be Hon. Lieut.; Aug. 9th. P. H. West (Lieut., E. Surr. R., T.F.), and to be Hon. Lieut., R. C. Broughton (Temp. Lieut., Leic. R.), and to be Hon. Lieut.; July 27th.

Prob. Flt. Off. J. A. Smith is granted a temp. commn. as Sec. Lieut.; Aug. 3rd.

Sec. Lieut. W. E. M. Walker relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut.; Aug. 31st.

The date of appointment of Temp. Maj. F. G. Brown is May 1st, and not as in *Gazette* June 4th.

The date of appointment of Temp. Capt. A. E. Verpillieux is June 1st, and not as in *Gazette* Aug. 20th.

The initials of Sec. Lieut. C. R. English are as now described, and not C. E., as stated in *Gazette* Aug. 6th.

The notification in *Gazette* Aug. 13th regarding Capt. (Temp. Maj.) G. Waddell is cancelled.

Medical Branch.

S. E. Duff is granted a temp. commn. as Lieut.; Aug. 27th.

Memoranda.

Lieut. (Temp. Capt.) S. S. Blackley to be Temp. Maj. whilst holding a special appointment in the Ministry of Munitions; Aug. 19th.

Sec. Lieut. W. Hallett-Carpenter is granted the hon. rank of Capt.; April 1st.

Lieut. T. F. Legard to be Temp. Capt. whilst specially employed; Aug. 22nd.

K. Burton to be Temp. Hon. Capt. whilst specially employed; Aug. 30th.

Sec. Lieut. A. E. Masters is granted the hon. rank of Lieut.; June 3rd.

The following relinquish their commns. on ceasing to be employed:—Lieut. (Temp. Capt.) J. Mair; Aug. 5th. Col. (Hon. Lieut.-Gen.) J. de M. Hutchinson, C.V.O., C.M.G. (Vice-Admiral, R.N.); Aug. 10th. Lieut. A. Campbell; Aug. 16th.

"With certain exceptions, all officers of the Royal Air Force who held temp. rank in the Royal Navy or Army on Jan. 1st, 1918, are confirmed in corresponding rank in the Royal Air Force, for the purpose of seniority, with effect from April 1st, 1918, and will therefore be shown as promoted to such rank in the next edition of the Air Force List."

Royal Flying Corps (Military Wing).

London Gazette Supplement, August 21st.

Flying Officer (Observer).—Lieut. W. L. H. Davies, Yeoman, T.F.; March 18th.

General List.—To be Temp. Sec. Lieuts.:—2nd Cl. Air-Mech. C. Sweetman, from R.F.C.; Feb. 16th. 3rd Cl. Air-Mech. M. Pennycock, from R.F.C.;

Feb. 17th. Sergt. C. F. Dakin, from R.F.C.; Feb. 18th. Corpl. G. A. Richardson, from R.F.C.; March 10th. Sergt. A. Hill, from Devon R.; March 18th. L.-Corpl. D. A. Watts, from R. Suss. R., Pte. (L.-Corpl.) W. H. Hopper, from R. Suss. R.; March 19th. Corpl. M. Dearman, from R.H.A., T.F.; March 30th.

London Gazette Supplement, August 23rd.

Flying Officers.—Temp. Lieut. E. G. Ruffitt, attd. Shrops. L.I. and to be transf'd. to R.F.C. Gen. List; Nov. 3rd, 1917. Temp. Sec. Lieut. (on prob.) E. H. Weatherall, Gen. List, and to be confirmed in his rank; March 18th.

The date of seniority of Temp. Lieut. J. Webster, M.C., Gen. List, is March 14th, 1917, and not as in *Gazette* May 4th.

Equipment Officer, 3rd Class.—Temp. Sec. Lieut. C. F. Dakin, Gen. List; Feb. 18th.

London Gazette Supplement, Aug. 26th.

General List.—Actg. Sgt. J. McP. Mitchell, from M.G. Corps, to be Temp. Sec. Lieut. (on prob.); Jan. 8th.

London Gazette Supplement, August 29th.

Flying Officers.—Temp. Sec. Lieut. (on prob.) O. E. Fleming, Gen. List, and to be confirmed in his rank; Dec. 19th, 1917.

Flying Officer (Observer).—Temp. Sec. Lieut. R. S. V. Morris, Gen. List; Sept. 29th, 1917.

Assistant Instructor in Gunnery (graded as an Equipment Officer, 2nd Class).—Lieut. A. R. Mutter, Wilts R. (T.F.), from an Asst. Instr. in Gunnery (graded as an Equip. Offr., 3rd Cl.); March 22nd.

Supplementary to Regular Corps.—Sec. Lieut. C. B. Willcocks to be Lieut.; Feb. 24th.



AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

Headquarters, R.A.F. Independent Force, August 25th.

"On the 25th inst. our machines successfully attacked a hostile aerodrome and the railway stations at Bettemburg and Luxemburg. Excellent results were obtained on the railway stations."

General Headquarters, August 25th.

"On August 24th our airmen carried out another day of varied work including much low-flying and artillery observation. Enemy machines were not very active till the evening. Seven hostile aeroplanes were driven down by us, and five German balloons were shot down in flames. Ten of our own machines are missing. During the 24 hours we dropped 43 tons of bombs on Valenciennes and Cambrai, railway connections being attacked amongst other targets. All our night-flying aeroplanes returned safely. We succeeded in destroying two enemy night bombing machines."

Headquarters, R.A.F. Independent Force, August 26th.

"On the night of the 25th-26th our machines successfully attacked the railway station at Frankfurt and the chemical factories at Mannheim. Very good results were obtained at Frankfurt. Two tons of bombs were dropped on the factories at Mannheim, causing fires and explosions. All these machines flew through heavy thunderstorms to attain their objective. Other machines attacked a hostile aerodrome, and dropped four tons weight of bombs with good results. All of our machines returned safely."

General Headquarters, August 26th.

"Throughout August 25th our low-flying machines continued to harass the enemy by bombs and machine-gun fire directed upon his infantry, guns, transport, and trains. Other machines kept contact with our own troops and observed for our artillery. Photography and reconnaissance were carried on as usual. Thirty-two tons of bombs were dropped by us during the day on railway junctions, such as Cambrai and Valenciennes, on enemy dumps, and on Bruges Docks. A hostile aerodrome was successfully bombed. Twenty-five German machines were brought down by us and one German balloon was destroyed. Thirteen hostile machines were driven down out of control. Five of our machines are missing. Heavy rain prevented night flying."

Headquarters, R.A.F. Independent Force, August 27th.

"Further details have now been received of the attack on Mannheim on the night of the 25th-26th inst. The attack was delivered from a height of 200 ft., the pilots narrowly avoiding some chimneys. Searchlights were flashed almost horizontally, lighting up the whole town, and an intense barrage just over and nearly parallel to the roofs of the houses was put up in a vain endeavour to shoot down our machines. The explosions caused by the bombs were very heavy, and in view of the height at which they were dropped very considerable damage is certain. Every bomb was seen to burst on the target. All our machines returned safely."

Admiralty, August 27th.

"During the period August 19th-25th Royal Air Force contingents working with the Navy have carried out bombing raids on the following objectives:—Bruges Docks, Bruges, Zeebrugge Mole, Zeebrugge, Zeebrugge Canal, Ostend Docks, St. Pierre Capelle, Solway Works, Middlekerke, Westende and Maria Aalter. Also the aerodromes at Oostacker, Ghisteltes, Martakerke and Vlisseghem. Approximately 27 tons of bombs were dropped. At Bruges many good bursts were observed, direct hits being made on a submarine shelter. Burst were also observed on store sheds both sides of the West Basin. Two large explosions and two big fires were caused in the docks. Anti-submarine, reconnaissance, photographic, and fighting patrols have been maintained. Enemy shipping and land batteries have been attacked. Our fighting squadrons have destroyed five enemy machines and driven down five others out of control. Four of our machines are missing. In home waters during the same period seaplanes, aeroplanes, and airships have maintained anti-submarine, convoy, and hostile aircraft patrols. Enemy submarines have been sighted and attacked, and mines located and destroyed."

General Headquarters, August 27th.

"In spite of clouds and rainstorms, a great deal of work was accomplished by our airmen along and beyond the battle front on August 26th. Contact patrols observed and reported the positions reached by our troops. Other aeroplanes dropped ammunition by parachute to our machine gunners. Observation for artillery fire was carried on with difficulty. Our low-flying aeroplanes bombed and fired on enemy troops and transports wherever a suitable target presented itself. During the 24 hours 24½ tons of bombs were dropped by us. Four hostile machines were destroyed, and one other was driven down out of control. Two German balloons were shot down in flames. Nine of our machines are missing."

War Office, August 27th.

Italian Front.—Since my last report the Royal Air Force has destroyed 10 enemy aircraft. Two of our machines are missing."

General Headquarters, August 28th.

"On August 27th our low-flying aeroplanes were again active on the battle front. In spite of clouds and rainstorms, enemy troops and transport were constantly attacked from the air with bombs and machine-gun fire. Much information regarding the progress of the fighting was supplied both by our aeroplanes and balloons. Aerial combats were numerous. In the course of these we destroyed nine hostile aeroplanes and drove five down out of control."

Seven of our machines failed to return. Two German balloons were shot down in flames. Our anti-aircraft fire also brought down a hostile scout machine. Twenty-two tons of bombs were dropped by us during the day. Stormy weather made flying impossible at night."

General Headquarters, August 29th.

"Low clouds, rain, and wind greatly interfered with flying on August 28th. Photography was almost impossible and observation for artillery fire very difficult. Six tons of bombs were dropped by our airmen and many rounds fired from the air upon enemy troops and transport in the battle zone. At various points small-arm ammunition was delivered by parachute to our troops in the forward areas of the battlefield. One enemy machine was destroyed in air fighting and another was brought down in flames by our anti-aircraft fire. Two of our machines are missing. At night 11½ tons of bombs were dropped by us, Cambrai junction and an aerodrome east of St. Quentin being heavily attacked."

Headquarters, R.A.F. Independent Force, August 30th.

"On the morning of the 30th inst. our machines attacked the railway station at Conflans and a hostile aerodrome. Direct hits were obtained both on the hangars at the aerodrome and the railway station at Conflans. In the course of fighting one enemy aeroplane was destroyed. All these machines returned safely. Another attack was also carried out by one of our squadrons on the stations at Conflans and Thionville. This squadron engaged a largely superior number of hostile machines. Fierce fighting ensued, in the course of which one enemy aeroplane was destroyed, one out of control. Four of our machines are missing."

General Headquarters, August 30th.

"Eleven hostile machines were shot down by us on August 29th and 10 driven down out of control. One German balloon was set on fire. Nine of our machines are missing. Our airmen were actively engaged in all departments of their work throughout the day. Fifteen and a-half tons of bombs were dropped on a variety of targets, including Bruges Docks and many railway connections beyond the battle zone. Unfavourable weather stopped night flying."

Headquarters, R.A.F. Independent Force, August 31st.

"On the night of the 30th-31st our squadrons made an attack on the hostile aerodrome at Boulay (in Lorraine). Some bombs were dropped also on another aerodrome. Very good results were obtained and a fire started at Boulay aerodrome. Ten tons of bombs were dropped. One of our machines is missing."

General Headquarters, August 31st.

"The weather was cloudy on August 30th, but the various activities of our Air Service were fully maintained all along the front. There was much useful observation by aeroplanes and balloons. Twelve enemy machines were destroyed during the day, and five driven down out of control. Four of our machines are missing. Bruges Docks and Zeebrugge Mole were heavily bombed, as well as a number of selected targets opposite to the battle zone. In all, 25½ tons were dropped during the 24 hours."

General Headquarters, September 1st.

"Six hostile machines were destroyed in air fighting on August 31st, and three driven down out of control. Seven of our machines are missing. In spite of low clouds, the work of the Air Force along the front was carried on throughout the day, in close co-operation with troops on the ground, by our aeroplanes and balloons. A large number of photographs were taken, and enemy movements kept under observation. Twelve and a-half tons of bombs were dropped between dawn and dusk. At night flying was impossible."

War Office, September 1st.

Salonica.—During the past fortnight we have brought down six enemy aeroplanes out of control."

French.

Paris, August 25th.

"The very bad weather on the whole front yesterday hampered the work of our airmen. Nevertheless, our chasing crews brought down four enemy aeroplanes. It was not possible to carry out any bombing raids during the day. The weather having improved during the night our bombing squadrons immediately took the air. Eighteen thousand four hundred kilogrammes of explosives were dropped in the rear of the battlefield and on the stations serving it. The bivouacs in the region of Ognolles, Guiscard, the stations, railway lines, and concentration zones of Laon, Anizy-Le-Château, Jussy, Chauny, La Fère, Ham, Semide, Pontravert, and Guignicourt were subjected to a hail of projectiles. Numerous hits on the mark were registered, and fires broke out at Loen, Guiscard, and Guignicourt."

Paris, August 26th.

Balkans.—British airmen bombarded enemy bivouacs in the Demirhisar region. A Serbian airman brought down an enemy machine in the Dobropolje district."

Paris, August 29th.

Balkans.—British airmen bombarded enemy bivouacs north-west of Doiran."

Paris, August 30th.

"During the day of August 29th our bombing machines attacked the forest of Pinon and the railway station of Anizy-le-Château and the crossings of the Allette in this region. More than 48 tons of projectiles were dropped. Twenty enemy

aeroplanes were shot down or fell in a damaged condition. One enemy captive balloon was set on fire."

Paris, August 31st.
"During the day of the 30th low clouds and mist greatly hampered aerial operations. Nevertheless, three German aeroplanes were brought down, and two captive balloons were set on fire. During the night, in spite of heavy fog, some aeroplanes were able to drop 3,150 kilogrammes of bombs on objectives in the Eastern region, on the railway stations of Canflans, Chambley, and Thiaucourt and the Hagondange and Karlshuette workshops at Thionville."

Paris, September 1st.
"In spite of the unfavourable weather, our aircraft carried out important work, particularly in conjunction with the infantry in the battle zone. Eight enemy aeroplanes were brought down or fell in a damaged condition. Flying at a low altitude, our day-bombing machines dropped 23 tons of bombs on enemy concentrations and convoys in the region of Vauxaillon, Neuville-sur-Margival, Laffaux, and Nanteuil La-Fosse. Several tens of thousands of cartridges were fired in the same regions on enemy troops."

Balkans.—The British Air Force bombarded enemy encampments in the Struma valley."

U.S.A.
"During the day the railway yards at Barricourt and Conflans were effectively bombed by our airmen. All our machines have returned."

Italian.
"Last night our aeroplanes again dropped about 4,000 kilogrammes of bombs on enemy aviation camps in the Friuli plain and Lagarina Valley, causing large fires. Hostile machines dropped bombs on the city of Padua, causing slight damage to buildings, but no casualties."

Rome, August 27th.
"Our aircraft in unfavourable atmospheric conditions carried out successful bombardment actions on enemy aviation camps and other military objectives."

Rome, August 30th.
"Our and Allied aeroplanes bombarded hutments in the Vezzone Basin (Lavarone Plateau), and from a low altitude attacked motor-lorry columns with machine-gun fire. Two hostile machines were brought down in air combats."

Rome, September 1st.
"Yesterday morning our aeroplanes reached Franzensfeste and, flying very low, dropped bombs with accuracy and effect on the important railway establishments there. Other bombardment operations were carried out during the day on the enemy's front lines and back areas by our own and Allied airmen."

"Last night Army and Navy airships bombarded the military works of Pola and the station and depôts of Primolano. Six hostile machines were brought down in air fighting. A seventh hit by the artillery fell near Noventa di Piave."

Belgian.
"Sec. Lieut. Coppens brought down a balloon in flames in the Zillebeke region. his 28th victory."

German.
"Our bombing squadrons, during the night of August 24th-25th, threw on the harbour works, railway stations, military works, and camps of the enemy 75,000 kilograms of bombs."

Italian Honour for Lord Weir.

It was announced on August 30th that the King has granted to Lord Weir, Secretary of State for the Royal Air Force, authority to wear the Insignia of Grand Officer of the Order of the Crown of Italy, conferred upon him by the King of Italy, in recognition of his valuable services to the Allied cause while in control of the production of aircraft under the Ministry of Munitions.

Honour for General Salmond.

It is announced in the *London Gazette*, under date August 13th, that the King has been pleased, on the occasion of his recent visit to his Army in the Field, to make the following appointment to the Royal Victorian Order:—

Commander.—Maj.-Gen. John Maitland Salmond, C.M.G., D.S.O., R.A.F.

Albert Medal for R.A.F. Officer.

It was announced on August 30th that the King has awarded the Albert Medal in recognition of gallantry displayed in saving or endeavouring to save life, to Lieut. Richard Walker Buswell, Cheshire Yeomanry (Temp. Capt., R.A.F.). On May 31st, 1918, Capt. Buswell was flying at Yatesbury, when he saw another machine sideslip to the ground and burst into flames. He flew to the spot and landed; and seeing that the pilot, who was enveloped in flames, was still living, he dashed into the fire and endeavoured to rescue him. Several attempts had already been made to reach the pilot, but owing to the very intense heat they were unsuccessful. Capt. Buswell, however, managed to get hold of the pilot's clothes, which, being in flames, came away in his hand. He then procured a belt and succeeded in extricating the pilot, but was too late to save his life.

From Germany to Holland.

It is announced that the following officer, who was a prisoner in Germany, has arrived in Holland for internment: Lieut. T. E. H. Davies, K.R.R.C., attd. R.F.C.

Promotion in the R.A.F.

It was notified in the *London Gazette* on August 30th that, with certain exceptions, all officers of the Royal Air Force who held temporary rank in the Royal Navy or Army on January 1st, 1918, are confirmed in corresponding rank in the Royal Air Force, for the purpose of seniority with effect from April 1st, 1918, and will therefore be shown as promoted to such rank in the next edition of the Air Force List.

Berlin, August 27th.

"First Lieut. Loerzer, Lieut. Koenneke, and Lieut. Bello won their 31st; Lieut. Huey his 26th, 27th, and 28th; Lieut. Laymann, his 23rd; First Lieut. Grein his 22nd; and Lieut. Blume his 28th aerial victories."

Berlin, August 31st.

"We have shot down in the last two days 52 enemy aeroplanes. First Lieut. Lörzer won his 32nd and 33rd; Lieut. Hennecke (? Koennecke) his 32nd, and Lieut. Laumann his 28th air victory."

Austrian.

"The continued enemy aerial attacks on the region of Feltre have claimed numerous civilian victims killed."

Vienna, August 22nd.

Albania.—A squadron of Austro-Hungarian and German airmen, consisting of military and naval forces, attacked the enemy aerodrome establishments near Avlona. Numerous fires were observed. Our aeroplanes returned in their entirety."

Vienna, August 23rd.

"An Austro-Hungarian aerial squadron undertook a successful bombing attack against the Italian flying ground near Mestre. Otherwise there have been no events of importance."

Vienna, August 24th.

"On the night of the 22nd air raids were made on Bozen and Gries by Italian airmen. The enemy dropped more than 30 bombs, killed several of the inhabitants, and damaged a hospital."

Vienna, August 27th.

"Bozen-Gries was the objective of the recent enemy aerial attack, which did no damage."

Bulgarian.

"After an air fight the German airman Finzler brought down an enemy aeroplane, which fell in flames in the rear of the enemy's positions east of the Tchernia, thus securing his 11th aerial victory."

Turkish.

"During the night of August 19th to 20th enemy aeroplanes attacked Constantinople without causing any damage. Some persons of Italian nationality were slightly wounded."

Constantinople, August 26th.

"On the night of August 25th-26th enemy airmen carried out another attack on Constantinople. Our barrage fire prevented them from flying over the town. Some bombs fell in our outer quarter of the city, but caused no damage."

Constantinople, August 28th.

"On the night of August 27th-28th enemy airmen dropped bombs and manifestos on Constantinople. Only minor damage was caused."

Constantinople, August 29th.

"One of the enemy aeroplanes which dropped bombs on Constantinople on the night of August 27th was forced by our anti-aviation fire to come to ground in the neighbourhood of Constantinople. The machine was set on fire. The airman, a British captain, who was wounded, was taken prisoner."

R.A.F. Officers' Service Dress.

The War Office announces that R.A.F. blue cloths for officers' service dress will shortly be available to tailors on the registered list under the P.A. scheme. No tailor using these cloths may charge more than the following prices for the finished garment, exclusive of badges, and badges of rank:—

	£	s.	d.
Tunic	7	10	0
Trousers	3	5	0
Breeches (cloth strappings) ..	4	10	0
British warm (lined)	7	12	6

The above prices are maximum prices, and it should be possible for officers to obtain a tunic from the cheaper class of tailors at prices ranging down to £6, and other garments in proportion.

The R.A.F. Nursing Service.

The new R.A.F. Nursing Service, to which Miss L. Jolley, A.R.R.C., was appointed Matron-in-Chief a month or two back, is now asking for nurses, and those who are accepted will be given honorary rank in the R.A.F. as follows: Matron-in-Chief, Major; matrons and superintending sisters, captains; sisters, lieutenants; staff nurses, second lieutenants. The uniform will be of R.A.F. blue serge; the headgear is R.A.F. blue bonnet for the Matron-in-Chief and matrons, and a three-cornered hat for sisters—straw for summer and felt for winter. Applications for further particulars should be made to the Secretary of the Air Ministry, Strand, W.C. 2.

Combining Out the Civil Service.

The committees which have been tackling the problem of "combining out" the Government Departments have made considerable progress. They have only dealt with Grades 1 and 2 men of the earlier military age, 19 to 43; it is estimated that there are 13,000 men of military age in the various Government Departments, of which 4,000 are considered essential for Customs and Excise and 3,000 for Post Office work. It is expected that 50 to 60 men will be obtained from the Air Ministry and from 300 to 400 from the Ministry of Munitions, subject to appeal to the Minister of National Service.

More Protests by Holland.

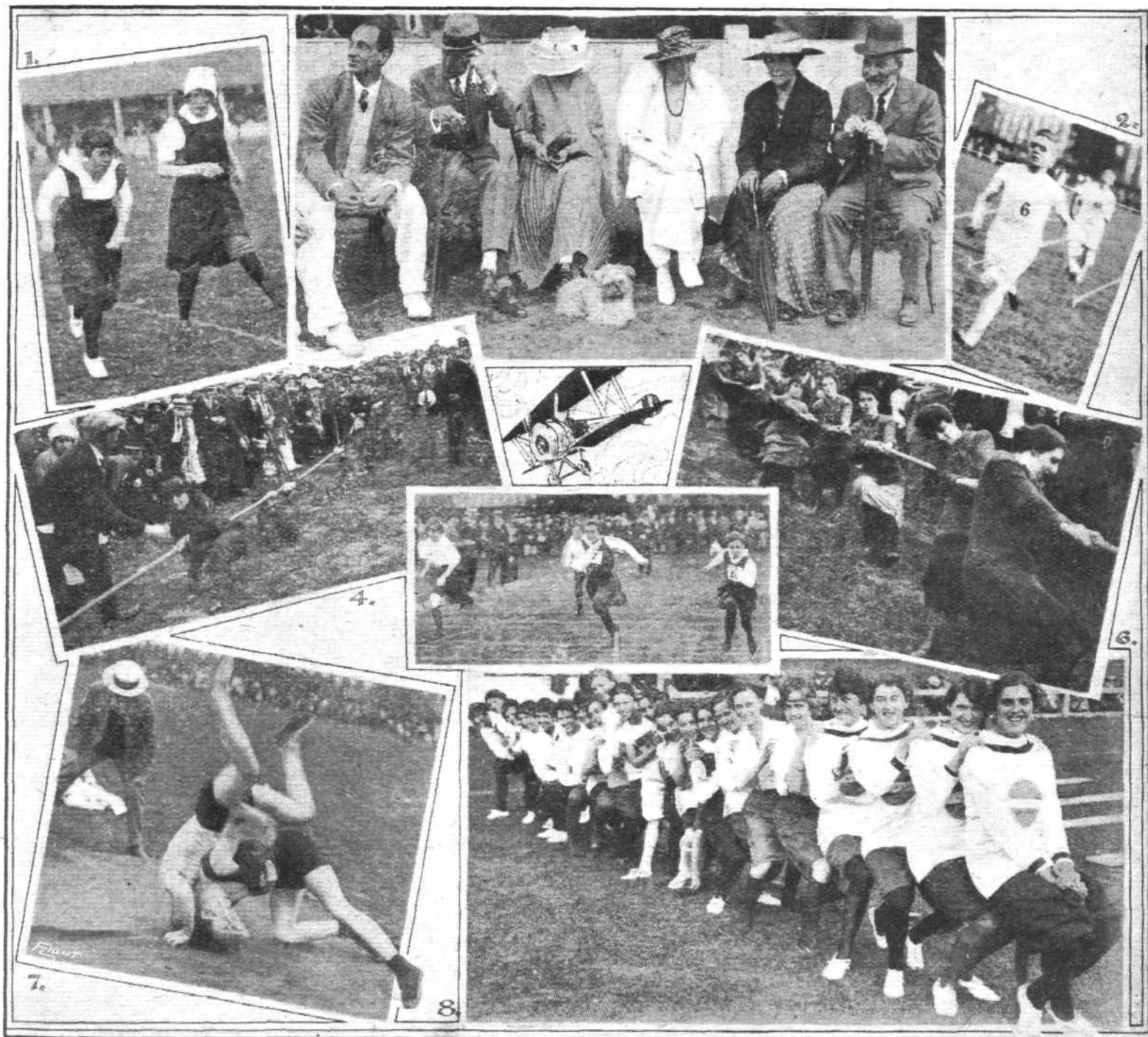
A PROTEST has been sent by Holland to the German Government against the violation of Dutch territory by a German aeroplane on August 19th. Holland has also protested to the British Government against the violation of Dutch territory by 17 British aeroplanes on August 11th.

LEISURE HOURS.

By way of a respite from their labours the staff and employees of Messrs. Hardingham Bros., of Westminster and Battersea, on Monday week spent a day on old Father Thames. The party, numbering about 200, embarked at Richmond and journeyed up the river to Staines, a stop being made at Chertsey Bridge, enabling those who wished to do so to have an hour's ramble ashore. Luncheon was taken on board, and Mr. Alfred Hardingham expressed the wish that it might be possible to have two or three such trips in the year. Mr. Charles Hardingham and Mr. Fred Hardingham also spoke, and Mr. Scott, Chairman of the Shop Stewards, in thanking the firm for their part in ensuring the success of the day, said that it was their first outing, and he hoped it

would be their last in war time, but the first of a long series in the new era of prosperity which he hoped peace would bring. During the trip several members of the party contributed musical items, and the piano was kept busy all the time.

FROM Major W. O. Darby we learn that the sports held by the Supply Department, M.O.M., on August 3rd resulted in a cheque for the sum of £600, representing the total receipts from all sources, being handed over to the R.A.F. Prisoners of War Fund. Brig.-General Alexander and the Committee tender their thanks to all who contributed towards making the meeting such a splendid success.



"Flight" Copyright.

AIRCRAFT SPORTS OF THE SOPWITH COMPANY AT KINGSTON.—From the following series of pictures taken at the Sopwith sports last Saturday it may be realised what a large share the women workers are now taking in aircraft construction:—1. Ladies' Relay Race. "Changing Over" in the first lap. 2. 100 Yards Handicap for Boys under 16. Final and finish. C. J. Mills wins. 3. From left to right: Mr. Sigrist and Mr. R. Cary, of the Sopwith Co.; Mrs. Sigrist, Mrs. Cary, Lady Burge, Sir Richard Burge (Mayor of Kingston). 4. Ladies' Tug-of-War (open). The Brocks team wore a black pierrot style of costume. 5. Final of 100 Yards Open Handicap for Ladies. Miss E. G. Shead (No. 7) won; Miss L. Blackburn (on right), second; Miss V. Coleman, third. 6. Sopwith girls pulled well. 7. An Exhibition Wrestling Bout. Fred Knight, ex-champion of England, on his head; still he came out on top against Thomas Owen (in the black jersey). 8. A few of the lady competitors waiting events.

UNFORTUNATELY the weather was very "patchy on August 28th, when the R.A.F. Wireless Experimental Establishment held their sports in Kent, but the programme was nevertheless carried through successfully, and there should be a substantial sum to hand over to R.A.F. charities. In the 100 yards scratch race the winner was Corpl. Beck, with Sergt. Coates second, and in the one mile Air-Mech. Firby won, with Air-Mech. Ghiradi second. In the 220 yards race the result was the same as in the 100 yards event—Corpl. Beck winning, with Sergt. Coates second. In the officers' 100 yards open event Lieut. Adams was first, with Major Carden second. There were a number of closed events as well as several of a novel order, which kept the large crowd of spectators interested and amused until Mrs. Heath-Caldwell presented the prizes at 7.30 p.m. After that an open-air concert was given, and dancing was carried on until 10 p.m.

ALTHOUGH the sports side of the Handley Page Social Club meeting on Saturday week was excellent, in the beauty competition was the outstanding event. To a panel of wounded soldiers was given the task of judging, but finding it beyond them they invoked the aid of Mr. Handley Page. Eventually the prizes were awarded as follows: 1, Miss Freda Kent; 2, Miss Lily Abbott, and 3, Miss Lily White. There was some close competition in the open events. In the 100 yards, for instance, A. E. Nicholls (H.P.) and J. H. McNab (Wilkinson) tied for first place, and J. F. Aggerbeny (Grahame-

White) and A. H. North (Wilkinson) ran a dead heat for third and fourth places. In the 220 yards J. H. Richards (Vickers) was the winner, with W. H. Bendon (Nieuport) second. The one mile relay fell to Whiteheads, with the Aircraft Manufacturing Company's team second. In the 75 yards ladies' race Miss White (Caudron) was first, with Miss Phillips a good second; the latter won the closed event. There was an excellent concert during the evening, and dancing for an hour or two, the Child's Hill Prize Band supplying the music. The prizes, including a shield for the department winning the greatest number of prizes, were presented by Mrs. Handley Page.

THE match at Lord's on Saturday, which wound up the cricket season, and which had been arranged on behalf of the Chevrons Club by Col. the Hon. F. S. Jackson and Capt. P. F. Warner, ended in a complete victory for Capt. Warner's side by 161 runs. Unfortunately Col. Jackson, Commander C. B. Fry and Lieut. V. F. S. Crawford were unable to take part, and Col. Jackson's side was captained by Lieut.-Col. J. W. H. T. Douglas. Capt. Warner's team made 244, including 86 by Air-Mech. J. B. Hobbs and 53 by Sergt.-Major H. T. W. Hardinge. Col. F. S. Jackson's XI made 83 in their first innings and 129 for nine wickets in the second, towards which Pte. E. Hendren contributed 58. Lieut. P. H. G. Fender took four wickets for 13 runs in the first innings of Col. Jackson's XI.



"Flight" Copyright.

THE R.A.F. WIRELESS SPORTS CLUB MEETING.—1, Tilting the Bucket. 2, Long Jump. A. M. McIntyre did well. 3, Col. L. F. Blandy, D.S.O. (on left), was interested in his men's prowess. 4, 220 Yards Scratch Open Race. Sergt.-Mech. Coates, W.E.E., beats Air-Mech. Collet, W.E.E., in the first heat. 5, Corpl. Pink, in spite of the loss of one eye at Mons, won the Cricket Ball Throw; later the camera caught him throwing at the Kaiser's head (wooden). 6, Egg and Spoon Race. Most of the spectators thought Miss Alder had won, but the judge ruled she was second. 7, Winner of the Three-Legged Race crossing the finishing line.



THE HANDLEY PAGE AIRCRAFT WORKERS' SPORTS.—From top (left to right): 1. Egg and Spoon Race. 2. A line up of lady competitors. 3. Mixed Three-Legged Race. 4. Up the straight in a handicap for ladies. 5. Mr. and Mrs. Handley Page at the prize table prior to distribution to the winners. 6. The Sack Race.

ALTHOUGH the police were on strike on Saturday their team put up a very good performance in the tug-of-war at the annual Sopwith sports at Kingston. As last year the tug-of-war items seemed to be the most popular with the crowd. In the ladies' 100 yards handicap there was a desperately close finish, Miss E. G. Shead just beat Miss L. Blackburn (Darracq). Unfortunately, Sopwith was not able to be present, but Mr. R. O. Cary and Mr. F. Sigrist

were here and everywhere taking a great interest in all the doings. The Mayor of Kingston, Sir Richard Burge, and Lady Burge were also present. There was a good display of wrestling given by Fred Knight, ex-champion of England, and Thomas Owen. The Sopwith Works Band played throughout the afternoon, and at the conclusion of the events the prizes were presented by Mrs. Reginald Cary. The proceeds were given to the fund for the R.A.F. Convalescent Homes.

CORRESPONDENCE.

Re Air Raids.

[1967] I always read your excellent journal with the greatest interest, but will you allow me to draw your attention to and your reconsideration of certain remarks you make in your last issue with regard to air raids? You appear to ascribe our immunity from raids to reprisals over German towns. Our raids into Germany are compelling the enemy to devote a great number of men, machines and guns to the task of defending the Rhine valley, which is all to our advantage, and is, I believe, having a great effect on the morale, certainly, of Western Germany. But I do not see, as you apparently do, that it is self-evident that the immunity of the past 104 days is due to the work of the I.A.F. over Germany.

I would submit that the reasons for our immunity during this period are as follows:—

(1) The fact that during a very large portion of this period the nights have been very short.

(2) That the winds during this summer period are from the West, S.W. and N.W. During the moon periods, the winds have thus been unfavourable for the enemy's raiding purposes. The enemy hitherto has come in a dead calm or with slight wind from the N.E.

(3) The excellent defence organised and maintained by General Ashmore which took a very heavy toll from the enemy during the last raid—May 19th.

A close observer of these matters stated some time ago that there were only about three days in each month suitable for enemy raids into this country, and it is highly probable that the summer months, taken alone, present no suitable days. The weather conditions are too unstable. The fact that an occasional fine moonlight night occurs is of no importance if it is preceded by a cloudy or windy night. The enemy is on the watch for sequences of fine days (i.e., dead calm weather), and these he has obtained only at certain specific times—must certainly around the equinoxes—as your records of raids will show.

I am surprised that you should suggest that the London bombing squadron has been withdrawn for defensive purposes on the Rhine. The machines defending the Rhine cities would surely not be of this type.

HUGH M. D. RESTON.

Clifford's Inn, E.C. 4, August 31st, 1918.

[This letter is referred to elsewhere.—ED.]

SIDE-WINDS.

MESSRS. ALEX. DUCKHAM AND CO., LTD., of Phoenix Wharf, Millwall, E. 14, write in connection with the necessity for economy in the use of lubricating oil, that it may not be known to some that oils that have been used are yet of some value because they can be refined though heavily surcharged with dirt or reduced in viscosity with paraffin or petrol. The company states that it is prepared to purchase existing or future accumulations of waste oil at a fair price and to distil the same for further use, thus assisting the mineral and transport resources of this country.

INCREASE of business has necessitated greater telephone facilities for the Wycombe Aircraft Constructors, Ltd., at their head offices. They have a new number—High Wycombe 235—which is additional to the old call—High Wycombe 84.

ONE of the first firms to turn their attention to the question of dope room equipment was the Aircraft Supplies Co., Ltd., and the "Ascol" dope can was the first registered design on the chicken-feed principle, and since it was first introduced has been considerably improved, the main idea, however, remaining the same. It is claimed for the improved "Ascol" dope can that the strictest economy in dope is effected, that the can is easily filled, handled and cleaned when necessary, and while it is practically airtight it holds sufficient dope for a shift, thus avoiding, as much as possible, any loss through evaporation during the night, or at any time when the can is not in use. The cans can be supplied numbered for use daily by the same operator. The original type of "Ascol" dope can is now employed for use exclusively with coloured paints, and can be had painted with a red, white, blue, or any other coloured band, to indicate the colour for which they can be regularly used.

In addition the Ascol Co. are supplying special fillers for the dope cans to avoid any wastage of dope in filling, and they also make a speciality of dope brushes. A descriptive leaflet on equipment for the dope room can be obtained from Ascol House, 125, Long Acre, W.C.

AMONG the many accessories which are necessary to the construction of the modern aeroplane is one, the importance of which is apt to be overlooked owing to its everyday character. Nevertheless, the brass nail with the dome-shaped head plays no mean rôle in the life of an aeroplane, and, to ensure rapid work of a lasting character its construction must be sound and accurate. The heads must be firmly attached so that they do not fall off in use, and must bear average driving without turning sideways.

In this connection, Mr. Arbenz, of Ludgate Hill, Birmingham, claims to be in a position to supply such a nail in a great variety of shapes and sizes with solid brass heads and steel shanks—and which he is at present furnishing in considerable quantities to the R.A.F., the War Office and to aeroplane manufacturers generally.

He is also in a position to supply iron and brass gimp pins in various lengths and thickness, from 20 W.G.; as well as such items as aluminium eyelets and washers, press buttons, turn buttons, aero-gauge hands or pointers, precision screws and any kind of light press work.

WHAT with the evenings drawing in and the insistent demand for economy in the use of artificial light, it is necessary to give consideration to getting the utmost value out of what light is consumed. In this connection the Lazilite comes to mind, for by its aid it is possible to adjust the light to any desired position. This means that in many instances one light will suffice, whereas with fixed lamps two would be required. The Lazilite Co., 5, Baldwin Gardens, Gray's Inn Road, are at all times willing to place their experience at the disposal of any one who has this matter of lighting in hand.

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Aviation Companies and Excess Profits.

It is announced that the Board of Referees have fixed the statutory percentage on capital invested in the aviation manufacturing industry at 18 per cent. for excess profits duty purposes under the Finance Acts. In addition an extra 3 per cent. is allowed in respect of new capital employed since last year.

An Extraordinary Accident.

WHILE a pilot was practising machine-gun shooting at a target which was floating on the Elstree Reservoir on August 28th, his gun missed fire and killed a resident who was standing in a cottage garden close by. A medical man stated that a bullet had pierced his heart, and he had other injuries.

COMPANY MATTERS.

NEW COMPANIES REGISTERED.

ALLIED BALL AND BEARING CO. OF GREAT BRITAIN, LTD., 2, Frederick's Place, Old Jewry, E.C.—Capital £100, in £1 shares. Consulting and general engineers, manufacturers of and dealers in wood working machinery, &c. First director: J. Mason.

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